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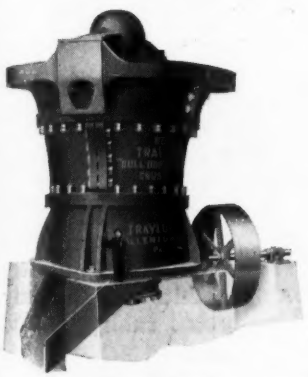

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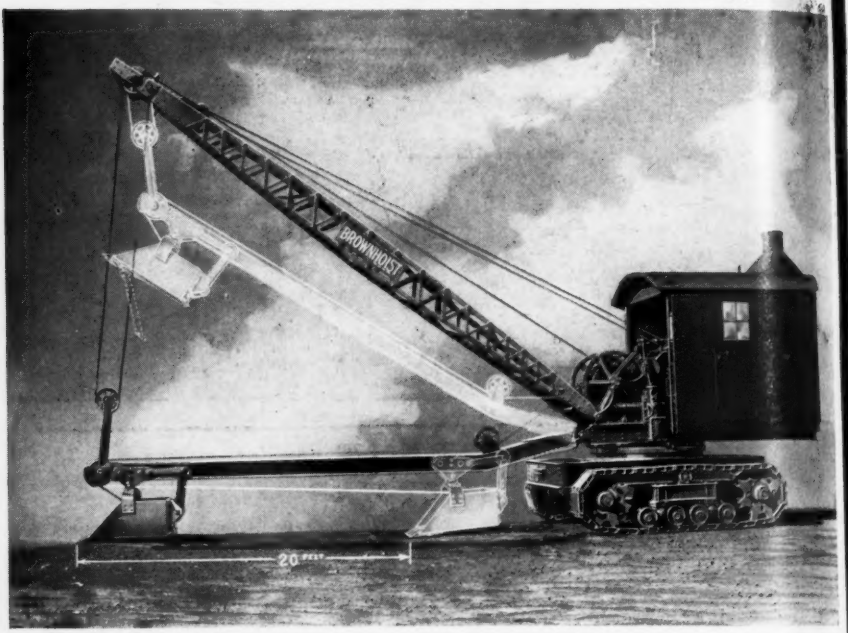

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Pit and Quarry

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VOL. 6 CHICAGO, ILL. APRIL, 1922 NO. 7

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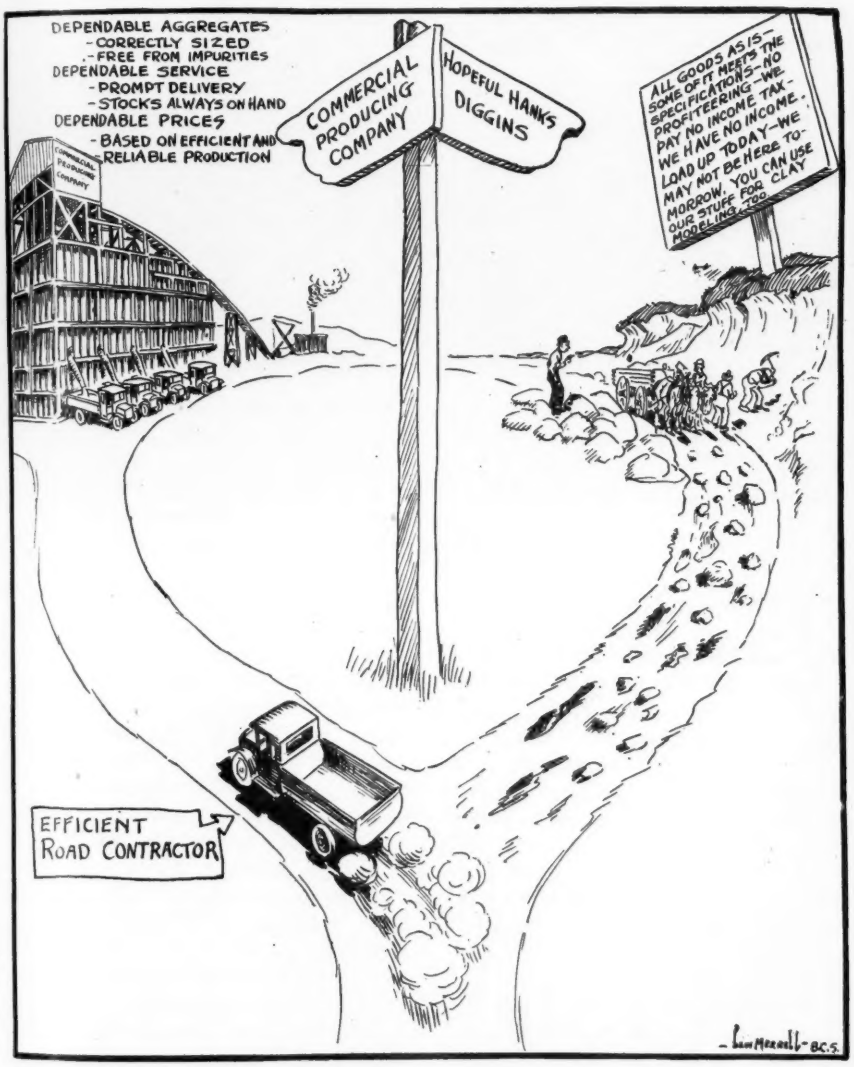
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He Knows Which Way to Go!

Drying Department, showing skip car track for charging drainage bins over dryers

Hoover & Mason's Phosphate Rock Plant

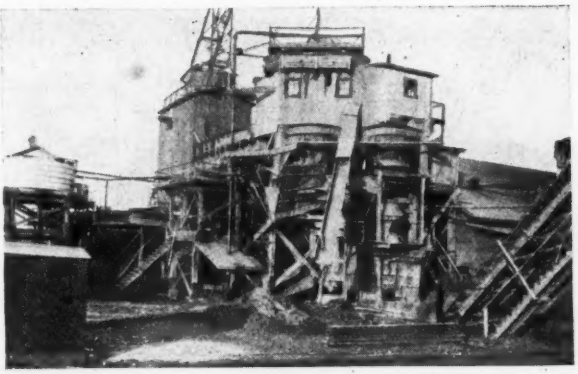
ONE of the best designed plants in the rock phosphate mining section around Mt. Pleasant, is that of the Hoover & Mason Phosphate Company. The first general impression one gains of it is that it is very compactly constructed; later and more definite impressions are to the effect that the methods employed are usually original and always efficient. As the plant was completed in 1918, the management was able to incorporate in its design the best and most modern ideas along phosphate production lines.

Adjacent to the workings are the complete quarters for both the white and colored employees, little communities in themselves. There is a school for colored children maintained by the company, and a commissary operated by the management on a co-operative basis which assures to the employee the best price on goods purchased with the greatest convenience to himself. The neatness observable around the quarters furnishes a reliable index to the character of the whole enterprise.

The properties represent an acquisition covering a period of several years. They are of the brown rock formation and the material requires washing to remove its impurities before becoming a commercial grade. The overburden runs from nothing to about fifteen feet and is removed by two large Monighan draglines with 70-ft booms, having Page buckets, one with a capacity of 1½ yards, and the other 2½ yards. The company at present is mining in a territory about a mile from the plant.

The major part of the mining is

done with one of the draglines but the clean-up work is accomplished with a machine specially designed by Hoover & Mason and which they call a "cantilever." This "cantilever" is self-propelled and has 80 foot overhang over the pit. The miners fill the buckets by hand. These are then hoisted and dumped into a hopper suspended on the machine from which the material is discharged into dump cars on the original ground level. The operator of this machine works from a cage suspended out over the pit, where he has a good view of the men at work.



Wash Department. Inclined track at right leads to dryers

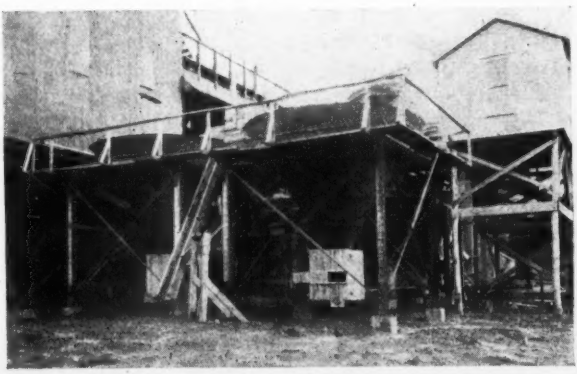
The material is brought into the plant in 4-yard Western side-dump cars, which are dumped into a skip in a pit, similar to blast furnace practice.

There is a receiving hopper at the top of the washer plant so that a uniform feed of phosphate to the plant is obtained. The Hoover & Mason people consider this very essential, as they at all times try to have a uniform stream of phosphate meeting a uniform flow of water from the pumps.

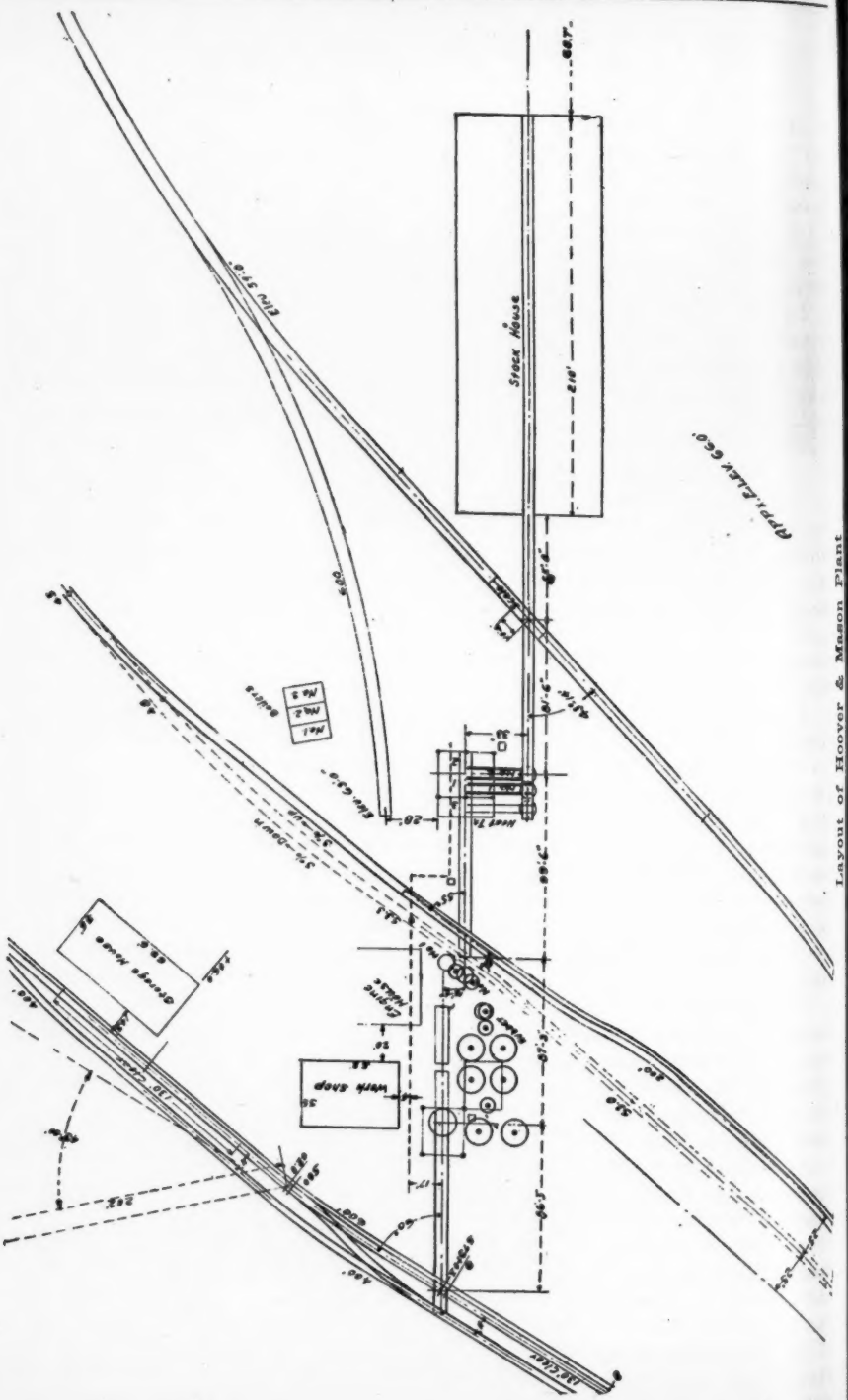
The phosphate is passed through two sets of double horizontal rolls of the company's own design, the lower set of rolls being spaced about three-quarters of an inch apart. From these rolls, the material drops to a "mulcher" of their own design. The object of this machine is to tear up the clay balls and properly prepare the phosphate for the process of separating the impurities. This machine approximates the action of a puddler in a brick-making plant. The material leaves this machine in about the consistency of a thick paste.

From here, it goes into an inclined revolving shell, which the company men call a "dasher", 6 feet in diameter and 20 feet long, with flights or lifters mixing the phosphate with the incoming water.

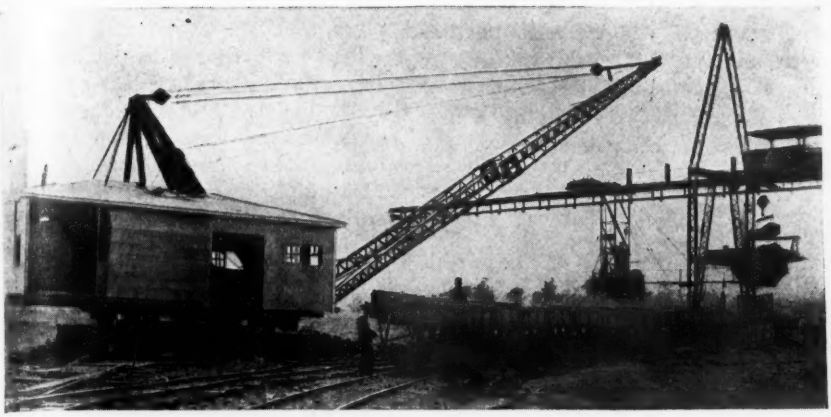
From this shell, the phosphate is discharged into an inclined revolving shell 7 feet in diameter and 30 feet is partially enclosed in a large wooden box, into which fresh water flows. Partitions in this wooden box compel water to flow through the shell. The fresh water is entered at the



Two of the big Allen Sand Settling Cones



Layout of Hoover & Mason Plant



One of the draglines, part of the "cantilever" and some of the dump cars.

lower end of the box and flows through the shell, meeting the phosphate coming from the dasher. In this way, a counter-current washing action is obtained and here the first roughing off of the impurities and fine phosphate sand is obtained.

To the end of this washer shell a circular screen of ⅝ inch mesh, 4 feet in diameter and 3 feet long, is bolted. Here a separation of the sand and lump takes place. The lump is conveyed by a chute to a bucket conveyor and thence to a picking belt, where clay balls and flint impurities are rejected by hand. No further work is done in washing or crushing the lump.

The sand which goes through the screen is taken up by two hydraulic jets and discharged into two 8 foot Allen sand cones. The overflow from these sand cones returns to the rear end of the washer box.

The sand discharged from these cones drops by gravity into a small specially designed machine called a "rubber", resembling the "mulcher" mentioned above. This machine rubs off the last of the adhering impurities on the sand grains.

The fine sand which goes off with the muddy water from the front end of the washer box is discharged into a battery of six 14 foot Allen sand-washing cones. In these cones, the final separation of the impurities and fine phosphate sand is obtained. This part of the system must be carefully watched, as the specific gravity of the impurities is almost the same as of the fine phosphate sand.

The overflow from these cones goes to an 8 inch Morris centrifugal pump and is pumped to settling ponds. The fine phosphate sand from the sand-washing cones is discharged by jets into an 8 foot Allen sand dewatering cone. The water overflow from this cone goes to a pump and is then discharged to the settling ponds. The underflow flows to a button conveyor which discharges it into the "rubber" mentioned above.

Here all the sand is mixed. The rubber discharges into a pit. Here, fresh water at the rate of about 500 gallons per minute is added, and a 6 inch Morris centrifugal sand pump elevates the mixture to two 8 foot Allen sand dewatering cones. Here the final separation of the sand and its impurities takes place. The water overflow from these cones goes back to the large washer box. The sand from the cones is discharged into hoppers where partial dewatering takes place. This completes the sand-washing process.

The muddy water from the wash-

Layout of Hoover & Mason Plant

ing process is discharged by flume to settling ponds where the impurities settle and the clear water returns by gravity to the pumps. At the present time, the company is building a new settling pond comprising about 55 acres in area.

The company secures its fresh water from a creek which flows through the property. The fresh water under pressure is supplied by a triplex 12x12 Deming power-driven pump. Additional fresh water is furnished by a 6 inch Morris centrifugal pump.

The sand recovery system was installed by the Allen Cone Company of El Paso, Texas, after considerable research work done at the plant. A very efficient sand recovery is obtained and the management is well pleased with this installation. Practically every washing plant in the field has installed Allen cone equipment to a greater or less extent.

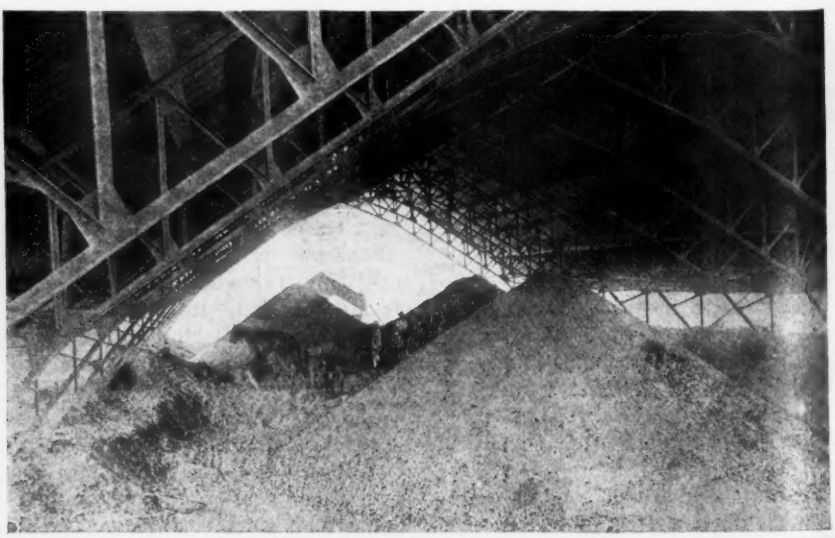
The lump and sand from the washer is discharged into a skip located in a pit and from there it is dumped into large draining bins over the dryers, where final dewatering takes place.

This company has two cylinder dryers. The dryers are equipped with Jones underfeed stokers. Each dryer discharges into a hopper which feeds into a drop-bottom skip car. This skip car goes up an incline to the top of their stock house and can be discharged at any point by means of a tripping arrangement.

The stock house is of novel design. The roof is supported by steel trusses which parallel the slope of the piles. About 12,000 tons can be carried in storage. Through the center of the stock house runs a concrete tunnel the top of which is at the floor level. In this tunnel is a belt conveyor with gates every few feet so that the material can be fed by gravity to the loading belt.

The company operates a Manierre electric car loader. They also have a magnet on their shipping belt to remove all iron. Cars are spotted on track scales for loading so that maximum car loadings can be obtained.

The capacity of this plant is from 300 to 350 tons of finished product



Interior of the stock house. Note how trusses parallel slope of piles.

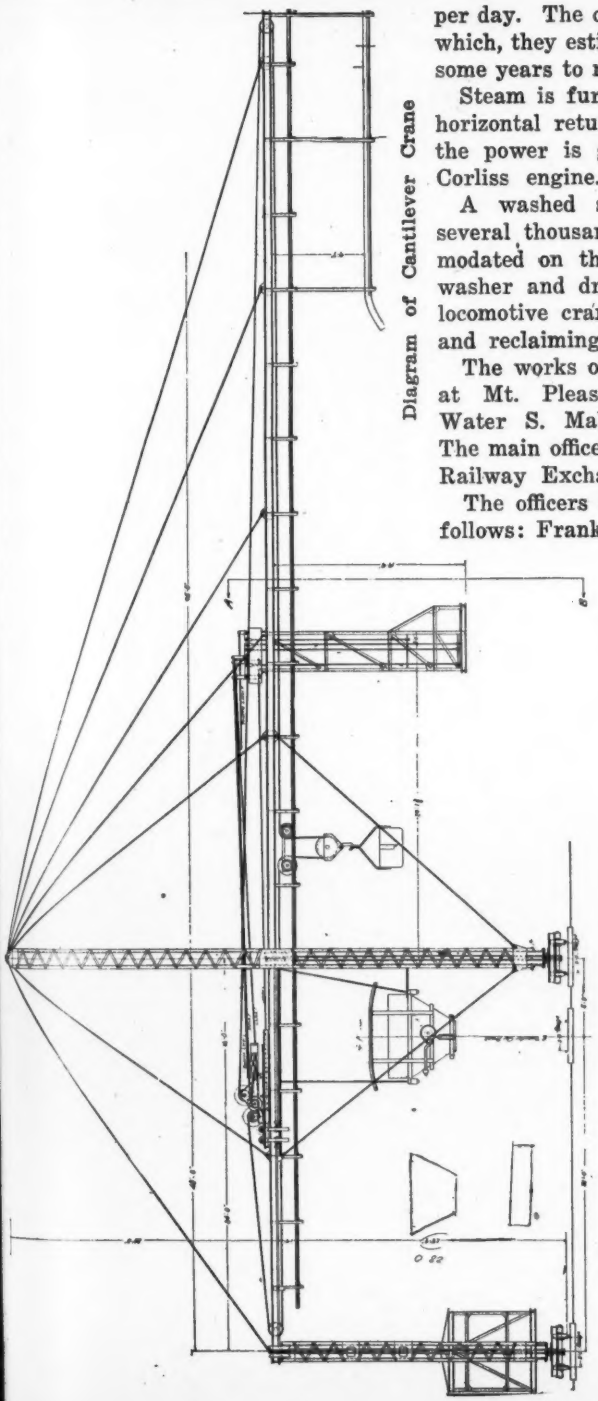


Diagram of Cantilever Crane

per day. The company owns holdings which, they estimate, will take twenty some years to mine out.

Steam is furnished from Erie City horizontal return tubular boilers and the power is generated in an Allis Corliss engine.

A washed storage amounting to several thousand tons can be accommodated on the ground between the washer and drying departments. A locomotive crane is used for storage and reclaiming.

The works office of the company is at Mt. Pleasant, Tennessee. Mr. Water S. Mabee is superintendent. The main office of the concern is 1407 Railway Exchange, Chicago, Illinois.

The officers of the company are as follows: Frank K. Hoover, President; A. J. Mason, Vice-President; Ray P. Hoover, Vice-President and General Manager; H. Earl Hoover, Treasurer; E. K. Scott, Secretary.

The officers of the company are associated with Hoover & Mason, Contracting Engineers, who, for over thirty years have been specialists in building iron ore-handling machinery. Hoover & Mason have done the engineering work for the Phosphate Company. The Phosphate Company has joint offices with Hoover Suction Sweeper Company, all in the Chicago office at 1407 Railway Exchange.

Getting Results for the People

WE are glad that A. R. Hirst, chief engineer of the Wisconsin Highway Commission, has decided that good roads, built as soon as may be, are much to be preferred to waiting for a possible drop of a few cents in the price of cement.

Mr. Hirst has never shown a disregard for the public welfare in the unnecessary expeditures of money, so that his judgment in the present case can safely be trusted.

Good roads are not like some commodities—to be bought only on a favorable market. If they are not bought when needed, every day of delay is an added expense.

We agree with the following editorial from the Chicago Tribune:

ECONOMY OF ROAD BUILDING

Wisconsin, which has a road system to be proud of—one of the best in the United States—has decided to break the five state agreement not to buy cement at more than $1.30 a barrel and to go ahead with its 1922 program for 400 miles of new roads even if it has to pay $1.41 fer cement.

Illinois, in the meantime, is rejecting bids of $1.40 a barrel and delaying its road building program partly for Small's political purposes and partly to get its material at $1.30. We do not feel qualified to settle the economic and more or less technical question of the proper cost of cement for road building, but we do look with favor upon the arguments offered by Wisconsin's chief highway commissioner for going ahead with the road work at once.

"The state highway commission," he say, "feels that the fight has been carried as far as it is profitable to carry it and that any saving in the price of cement which might result from a continuance of the boycott will be far outweighed by the loss to industry and to labor resulting from holding up the construction season about to open."

There is a great deal in that statement. Bad roads are a liability. Good roads are an asset. Bad roads are liable to cost farmers and townspeople a great deal more in a single year than the total of 10 cents a barrel on the price of cement to be used for good roads.

We do not want to be held up or exploited. We do not want to be forced to give an unfair profit to cement dealers. Neither do we want to give an unnecessary profit to wagon makers, tire manufacturers, or automobile equipment dealers, as we must do when we haul our produce and supplies and drive our automobiles over bad roads.

Between the two probably there is a happy medium. The Wisconsin chief engineer, A. R. Hirst, who gets most of the credit for his state's fine road system, sees compensation for the comparatively high cost of cement in the comparatively low cost of labor. He believes he can build now as cheaply as he would build next year even with slightly cheaper cement. And he knows that every year's delay of building costs the taxpayers of the state many hundreds of thousands of dollars which could be saved if they were enabled to travel over good roads. If that is good policy in Wisconsin it is worth consideration in Illinois.

IN February, 1921, permits were taken out in Chicago for 181 residences and 41 apartment buildings, and the newspapers talked of the arrival of the long expected building boom. This year, for the same month, permits for 288 residences and 292 apartment buildings were taken out. This is a good indication, not only because of the amount of business which it represents, but as showing that, however much an enforcement of the Landis award has fallen short, it has had no inconsiderable influence in restoring confidence.

IF the Transportation Act needs to be amended, why, that's the thing to work for!

TAKE road building out of politics! This may apply especially to Illinois, but it includes other states also!

Overhead Costs Through Idle Periods

IN the pit and quarry business during the winter months the overhead cost of running is generally excessive and if a plant is shut down for any length of time, the only expense that continues is that of the overhead.

Besides this, without production going on, it is the proper time to make repairs and improvements to the plant, while such work as pumping and stripping may have to be done. Thus the overhead not only goes on as in the other months but becomes larger, without an opportunity of directly charging it off against the output.

Even if this could be done, it is a wrong principle, as the overhead during one month may be less than a third of some other, and it is readily seen that there would be a large divergence of charges.

The proper method to follow is to keep such records for a long term and then charge an average overhead against production during the operating season.

For instance, take stripping of overburden. During one winter sufficient stripping may be done in a gravel operation to last several years. If the approximate tonnage stripped can be estimated, then a unit charge can be made against all production for this one item, even several years after the actual work has been done.

An overhead charge of this kind is easily figured and applied; but for many items that must be included in the overhead, as for instance remodeling and repairing the plant, the charge cannot be a direct one. New machines must be treated as a capital account, with interest and depreciation only as a direct charge.

If such an item is to be charged against each ton or yard sold, then it can be handled by knowing or estimating the probable production. This means to use an average charge, yet it is the only way possible if overhead is to be added to each sale made.

Without adding such a charge it is possible to make sales at prices that will in the end show no profits.

Thus any cost-keeping system must take into consideration the keeping of all extraordinary costs, especially during idle months when the plant is shut down, and must provide for these costs being distributed over the periods of production for one or more years.

If this is not done, pit and quarry operators are not able to tell each month, week or day, if they are making money. It is only possible to tell something at the end of a season, and then a trial balance taken from the books may show a deficit rather than a profit.

Many corporations have gone on the rocks because they did not know their overhead costs.

ONE estimate on the consumption of powdered coal in the United States indicates about 14 million tons a year. Something like half of this is used in the cement industry. In fact the cement industry is not only one of the large consumers of coal but it is easily the largest of the consumers which use coal in powdered form. The review in this instance does not indicate what other industries use powdered coal extensively, but it is thought that not more than 7 per cent of the annual consumption of powdered coal is used for power plants, consequently the bulk of it goes into specific industries like that of cement making and other industries where conditions are such as to make coal in powdered form desirable.

City Contemplates Construction of Inferior Pavement

FOR some time the city of Peoria, Illinois, has been considering the construction of a type of road whose inherent weaknesses have become apparent to most highway engineers and investigators of modern road building. The proposal is to pave one of the streets in Peoria, over which there is considerable motor truck traffic, with brick laid upon a base of pit-run gravel. It is estimated by the City of Peoria that the cost of this work will come to about $2.20 a square yard, or fifty cents a square yard less than the average cost of a square yard of solid concrete road at the rates for which solid concrete roads have been built throughout Illinois during 1921.

These in brief are the facts of the case. Let us see what the tax payers of Peoria would be getting for their money.

The chief desiderata in a modern road, built for automobile and motor truck traffic, are capacity to withstand wear and smoothness of surface. The importance of the first requirement goes without saying; the necessity for the latter is apparent after one has made but a superficial investigation of the action of a motor truck wheel upon the road.

About the most destructive force that can be applied to the surface of a road is that given by the impact of the rear wheel of a heavily loaded and fast moving vehicle. A few years ago when trucks were hauled slowly by horses, smoothness of surface was not so essential, but with the 900 per cent increase in motor truck traffic during the last six years, evenness of the road surface presented to vehicle wheels has come to be about the most important feature of a good road. This brick road that the city of Peoria proposes to build would, when first constructed, be perfectly satisfactory on this score. The bricks would be laid in evenly and all the joints between the bricks closely filled with cement grout, asphalt, tar or some mastic preparation. But after the foundation of gravel has moved ever so slightly, as it is sure to do under the recurring pressures exerted by the wheels of passing trucks, whole series of ridges caused by the edges of the slightly raised bricks will develop, and there will soon exist a condition described in a pamphlet of the American Road Builders' Association, issued during the Good Roads Show in Chicago this year:

"The truck wheels rising over the small elevations and falling into the adjoining depressions deliver great, hammer-like blows, the effect of which upon the road is greater by far than the dead weight of the vehicle and its load. They do not greatly wear the surface of the roads, but the shattering effect of the impact is much worse than surface wear. The deterioration is not, as formerly, a product of many vehicles and long periods, but may result from the passage of a single heavy vehicle, in the same way that a bridge will collapse under a load which is too heavy for it. To prevent this damage is perhaps the most important of the new highway problems."

The same condition is set forth in a carefully prepared paper read on January 19th of this year at the Good Roads Congress in Chicago, by Mr. H. Eltinge Breed, consulting engineer of New York City:

"We know now that impact is the great cause of destruction in our pavements. Impact is the bumping

or banging of one object upon another. As I roll a smooth cylinder along a smooth table there is practically no impact, but let ridges appear in the table, and as the cylinder bumps along over them, you get a series of impacts that, if the cylinder be heavy enough and rolled often enough, will soon wear out the surface and damage the structure.

"That is analogous to what is happening to our roads. If the wheels of vehicles are smooth and the pavement surface is smooth there is no damaging impact from traffic. The road lives even though it be weak in proportion to the volume and weight of traffic it must carry. But let surface irregularities develop, and no matter how strongly built, the whole pavement soon shows the effects of wear. We build our roads on an average to withstand a pressure of 800 pounds per lineal inch width of tire. Yet if an unevenness in surface of only ¼-inch occurs, the impact of one rear wheel of a five (5) ton truck may exert an impact pressure upon the road of 20,000 pounds. Under such pressure, the unevenness becomes a depression whose edges spall and break, causing further impacts and more depressions until the pavement is badly damaged."

That road of uneven surfaces cannot stand up under rapid motor truck traffic is without a doubt. It is also certain that brick pavement contemplated for Seventh Street in Peoria will quickly develop these irregularities of surface, and present to the destructive rear wheels of heavy motor trucks a series of ridges which spell an early destruction of the whole road.

It is observed that in roads of this type the gravel underneath the brick surface begins quite early in the life of the road to flow from under the pressure of passing wheels, and causes depressions which mean that a number of brick ridges are exposed to the wheels. The pressure is not distributed evenly over large areas as in the case of concrete roads, but is concentrated in a small space and, in many cases, transmitted to the dirt sub-base on which the road is built. In most cases where this type of road has been tried out it has not come up to expectations. Rockford and Elgin in Illinois and Beloit in Wisconsin have tried it out and found it very unsatisfactory.

The tax payers of Peoria would save money for themselves if they would insist upon a solid concrete road, which could be built for about fifty cents more a square yard.

Abandoning Plant

The Kickapoo Sand and Gravel Company, Attica, Ind., is offering for sale its entire plant, owing to abandonment of the train service by which its product was handled.

Regarding this, the president, P. A. Stewart, says:

"If this were a case of railroad employes tieing up the road with a strike, or a case of the road refusing cars to any particular industry, the papers would be full of it, but in our case the C. & E. I. R. R. merely stopped all train service on their Brazil to Momence and La Crosse division, closed all stations, and laid off or transferred all employes, on December 31st, 1921, under decree of Judge Carpenter of the Federal Court. This is the C. & I. C. Ry., known as the Coal Road, and a petition has been filed with the Interstate Commerce Commission to abandon it. We are unable to see any definite prospects for future operation of the road, and have therefore decided to dismantle our plant and sell all the equipment. It looks very much as though a number of grain elevators and other industries along the line will have to do likewise. Rather tough for us, after we have had a profitable business at Kickapoo for the past 14 years."

The Pilot Knob Gravel Company, Winchester, Kentucky, has been organized with a capital of $250,000.

A Legal Plan for Reducing Bad Debts

BY REQUEST I am eliminating the name and address of the association secretary who writes the following letter. Its subject matter will no doubt be interesting:—

————, Illinois.

At the last meeting of our association it was decided to ask you to be good enough to give us your judgment as to the lawfulness of a plan we would like to put into effect if it is not a violation of law. This association is composed of about 95 per cent. of the merchants who do business within the ———— territory. The other 5 per cent do not amount to so much and are just as well outside the association as in it, so far as we are concerned. Our members have found that during the year 1921 their losses from bad debts have been many times as much as in any year before, which is no doubt due to the conditions of the times. Still, as we do not know how long these conditions will continue, we wish to devise some way of protecting ourselves against more bad debt losses if we can do so legally. It is not possible to do a cash business in this section. It has been tried a number of times and has never been a large success, although some firms are still in business in a small way who do it on that plan.

Would the following plan be legal? For every member of our association to sign an agreement not to give credit to any person, firm or corporation who owes an unpaid account to any other member of the association? I should explain that we mean accounts that are overdue. The Executive Committee decided on a plan that when the account is actually delinquent, the name of the customer shall be at once sent to the association and at once transmitted to every member. After that nobody can give that person credit, although under the original plan they can sell him for cash. Another phase of the plan is that when an account is getting slow and it looks as if there might be some doubt as to its collection, the member whose customer this is, sends it in to the association with two stars after it, meaning something like, "Getting very slow. Watch!" This is then also to be sent to each member.

A motion was made that after a name had been sent out as delinquent, that nobody could sell him even for cash until he had paid the old account. A lot of our members would like to do this, but are mostly convinced that it would be dangerous. You might let us know your opinion of this also.

Part of this plan is legal, partly illegal. That part which would compel members to cease selling delinquent debtors on any terms until they had paid their old debt is in my judgment illegal and would open the members of the association to an action for conspiracy.

That part of the plan which merely contemplates a refusal to give credit to any customer who had proven himself unworthy of it is perfectly legal, and can be safely undertaken. It goes little further than a mercantile report, which has always been upheld as legal. Suppose the association merely issued to its members a report that a certain customer owed a member an account which he was not paying. Practically every member, on the strength of that report, would refuse credit to that customer, anyway. The agreement merely binds the members to do what their commonsense would constrain them to do without the agreement, provided they had the information, to which they are perfectly entitled.

Let everybody beware, however, of sending to the association as delinquent the name of a customer who has refused to pay an account because he disputed it. If such a customer's name is transmitted to the association and transmitted by the association to its members, and on the strength of it the members all refuse credit, the victim can surely collect damages from everybody who joined in the scheme, knowing that he was not delinquent, but was simply disputing the account. An association which makes such a plan should be

exceedingly careful to see that the names it is asked to send out represent delinquents and not disputants.

The reason this plan is not illegal if carried out as to real delinquents is that it does not deprive buyers of what they have any vested right to have, viz.: credit. More, in the case of delinquent debtors, it deprives them of something which their record shows they are not entitled to.

The main trouble with such plans is how to enforce them. Usually there is a provision penalizing any member who grants credit in violation of it, but it can never be enforced. Since it is a legal binding contract, the man who violates it can be made to pay all actual damages suffered by the other parties to it, but you can't penalize him in the way it is usually done. It would be difficult to prove any actual damages in such a case, I think.

(Copyright, 1921, by Elton J. Buckley.)

RATE reductions are not going to come in time to have any effect on 1922 contracts so far as present indications go. So let's get all the business we can on the present basis!

The investigation of dolomite cements will be continued at Columbus, Ohio, by the Bureau of Mines. Free lime in dolomite cements, calcined above 800°C. causes excessive shrinkage and cracking in the finished cements. Dolomite cements, containing practically no free lime, may be prepared by calcining the rock at a sufficiently low temperature (below 800°C.) to decompose the magnesium carbonate but not the calcium carbonate. The investigation will consist of calcining dolomite at a temperature high enough to decompose both the magnesium and calcium carbonates and adding suitable agents to react with the lime. By such a procedure the troublesome effects of free lime are neutralized and the cementing properties of the lime can be used to advantage.

Large Size Gravel Should be Crushed

DURING the past year one of the editors of this journal visited a large gravel producing plant being operated by one of the big production corporations in the East, and found an excellent plant for excavating, washing and grading gravel. To his surprise, however, there was a large amount of tailing, large size gravel, that had to be cared for and placed in a pile.

No doubt the operation was netting a nice profit, yet here was not only a waste, but an actual expense in handling and piling a product that could not be sold.

Contrast this with a much smaller operation, one that the owner termed, "a small one man plant," that would not produce in a couple of days the tonnage that the large plant would put out in an hour, yet all the gravel that the screen rejected as oversized, was run by a chute into a small jaw crusher and broken up, then elevated and graded.

What was done at this plant should have been done at the large operation, and thus have made a waste and an expense become a new source of revenue.

Every gravel producing plant that has a fair percentage of large gravel or boulders that cannot be sold, should be equipped with a small crusher to break up these stones and, by means of an elevator, carry the crushed gravel to the screens to be graded, the same as the small gravel taken directly from the bank.

Such a crusher with all its appurtenances is not expensive to purchase or operate and it quickly pays for itself.

WISCONSIN is going to build roads, regardless! That's what a highway department is for!

Gravel Plant Rebuilt to Extend Operations

By FRANK M. WELCH
Chief Engineer, The Greenville Gravel Company, Greenville, Ohio.

DURING the writer's varied experience in the design of sand and gravel washing plants, probably one half of his time has been spent in the redesigning and rebuilding of plants which have proven inefficient or inadequate to meet the demands of the market. Of the inadequate operations, increased production, more storage capacity or the addition of crushing facilities constitute most of the required alterations. Very often all of these features require attention along with a general overhauling and rearranging to increase the efficiency and decrease the cost of production. Although these ailments furnish ample excuses for the revamping of many plants every winter, worn out and antiquated machinery, opportunities for electrification, the fact that certain sections of the pit become exhausted and changes must be made to receive materials from other directions, and innumerable unexpected developments further contribute to the demands for redesigning and rebuilding.

From an engineering standpoint, one of the most interesting and unusual problems was confronted in solving the troubles of the Atlas Sand, Gravel and Stone Company of Hartford, Conn. This plant is located on a traction line eleven miles out of Hartford, and near West Hartford. Mr. Stewart N. Dunning is president of the company and Mr. A. C. Sternburg is vice-president and general manager. Their shipments are handled entirely by the traction line into Hartford, West Hartford and other neighboring points by means of dump cars, each of which is equipped with motors and controllers for operating in either direction. There are four dumping bodies or compartments on these cars, each of which can be dumped separately on either side of the track or into bins underneath. The company has a large retail yard with overhead bins as well as ground storage in West Hartford, from which trucks operating into all sections Hartford and West Hartford. At the pit, these cars are loaded underneath as well as at one side of the washing and screening plant and ample trackage with switches and turnouts make rapid loading and quick return trips of the electric dump cars possible.

The plant was served with a cableway excavator and equipped with shaker screens and a mechanically operated sand settling tank. A small jaw crusher located on the ground reduced the oversize material from which it was re-elevated by means of a very long bucket elevator to the top of the plant. Their bin storage was fairly large and was supported on heavy concrete foundations located on either side of the main loading track.

Two years ago all of the material within reach of the cableway excavator became exhausted, although a large acreage of excellent sand and gravel yet remained untouched. Their washing and screening equipment for various reasons had never given them the capacity desired and this together with the excessive cost of upkeep and repairs, had made the entire operation a losing investment. They then determined to modernize the plant throughout and to change their excavating equipment to reach all parts of their deposit. They purchased a

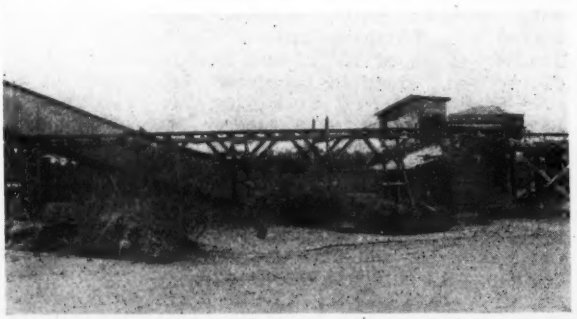
6-ton gasoline locomotive, a steam shovel, screens, line shafts, settling tanks, 2 jaw crushers and a belt conveyor.

With most of their purchases came drawings or blueprints showing how to install that particular piece of equipment; but how to assemble the entire lot of machinery in conjunction with the structure which they already had into a modern efficient sand and gravel washing plant was indeed a problem. They were confronted with an array of new, second hand, used and worn-out equipment nearly sufficient to build two plants and with an old plant designed for receiving material from a cableway excavator as some place from which to start. At about this time the writer became interested in the project and assumed charge of the rebuilding operations.

The bins were of rather substantial construction. By extending them to allow storage for one more grade of material and by partially dismantling and rearranging the superstructure over them, locating and setting of the screens, driving machinery and settling tanks was not difficult. About one-half of the nearly new Robbins 500 foot belt conveyor was required and the balance of it was stored away to be used later as repairs. The conveyor, being 36 inches wide, was capable of much greater capacity than either the screening or excavating equipment could handle, so its speed was reduced to balance the rest of the plant, thereby decreasing the wear and tear on it and increasing its life of service. The conveyor was so long that it had originally been designed for driving near the center of its length, but it was equipped with long sliding take-ups at its tail pulley instead of the almost universally used vertical automatic type. The drive was changed to the head pulley, and the remaining pulleys, which were intended for the center driving mechanism, were utilized in a vertical take-up.

The market did not at that time require the rescreening of crushed gravel, and the two jaw crushers were installed at the foot of the belt conveyor, underneath the receiving hopper. A scalping screen was installed between the receiving hopper and the crushers, which rejected all oversize material to the crushers and passed all marketable sand and gravel direct to the conveyor. The crushers on either side were also set to discharge direct onto the conveyor for reasons stated above.

The steam shovel had adequate capacity. The 12-yard dump car was sufficient but the cost of pit track maintenance could have been reduced, had there been smaller cars and more of them. The greatest difficulty was found with the 6-ton locomotive, which should have been at least a 20-ton unit. It would barely move the 12-yard car when loaded on a straight track and much unnecessary expense was incurred keeping the curves in perfect shape to get the big loaded car around them. When the locomotive with its car arrived at the



Showing how cars are dumped at conveyor.

foot of the incline extending up and over the receiving hopper, it failed completely.

Fortunately the cableway excavator, which was no longer on the program, was equipped with a large electric hoist that was still in first class condition. This was installed in a hoist house built at the head of the incline and was used to haul the dump car up the incline after the locomotive was uncoupled. Although considerable time and efficiency were wasted at this end of the operation until a larger locomotive was obtained, the balance of the plant produced several times its former daily capacity without further purchases of equipment, the results exceeded the expectations of all concerned and the entire proposition was converted in a few months from a losing into a paying one.

U. S. Gypsum Net $1,769,157

The last annual report of the United States Gypsum Company shows net income after taxes of $1,769,157, or $6.48 a share on its common stock after deduction of preferred dividends. Its net earnings were $2,247,326 and its Federal taxes, $478,169. Dividends of $792,455 were distributed by the company, leaving its surplus for the year at $976,702.

The Orton & Steinbrenner Co. of Chicago and Huntington, manufacturers of locomotive cranes, clam shell and orange peel buckets and coal crushers, have made arrangements with J. Ross Bates, formerly connected with Wonham Bates & Goode Trading Corp. of N. Y. and Boston, to represent them in the New England States and New York City. Mr. Bates has offices at 136 Liberty St., New York City and 128 School St., Watertown, Mass.

John A. Kling, president of the Kelley Island Lime Transport Company, Cleveland, O., announces that this company will purchase the Great Lake Stone & Lime Company, Rockport, Mich., the purchase involving about $1,250,000 cash.

Boiler Scale a Detriment to Efficiency

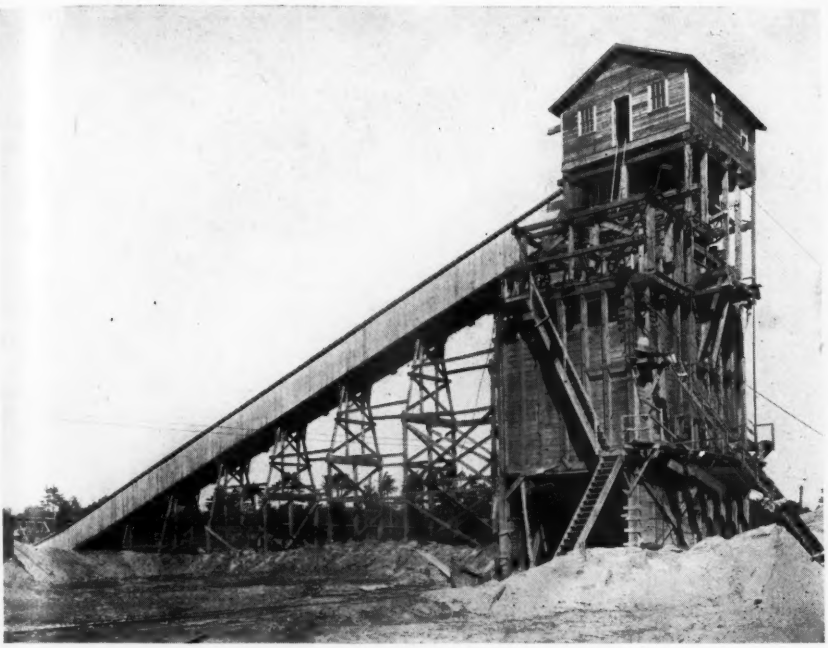
RECENTLY a quarryman told the writer that before he started work in the Spring, he would have to clean from his boilers the scale that had accumulated during the winter, while the boilers were out of use.

No doubt there was scale in these boilers, but it had not accumulated during the months the boilers were out of commission. Rust may have formed in that time, but not scale. Scale comes only from heated and evaporated water. Sediment may come from cold water and rust from moisture, especially when the boilers are not in use, but scale is forming all the time that a fire is under the boiler.

This scale should be removed at regular periods. Its formation on the tubes and the boiler shell can be retained by various means, but that attaching itself to the steel must be knocked off and blown and cleaned out of the boiler.

Unless this is done the fuel bill will be much larger and the boiler cannot be efficient, for it must be remembered that boiler scale resists heat to a remarkable degree, one hundred time more than metal. Thus one tenth of an inch of scale is equal to ten inches of boiler plate in resisting heat. Little wonder that a scaly boiler steams badly.

Work is to be continued by the Bureau of Mines in dead burning dolomite for refractory purposes. In previous work dolomite brick were made which stood 6 months' storage in open air after which they disintegrated. The new work will consist of using highly aluminous fluxes in order to make a more stable product. Experiments in treating the fire brick by soaking them in sulphate solutions will be undertaken thus converting the uncombined lime to the more staple calcium sulphate.

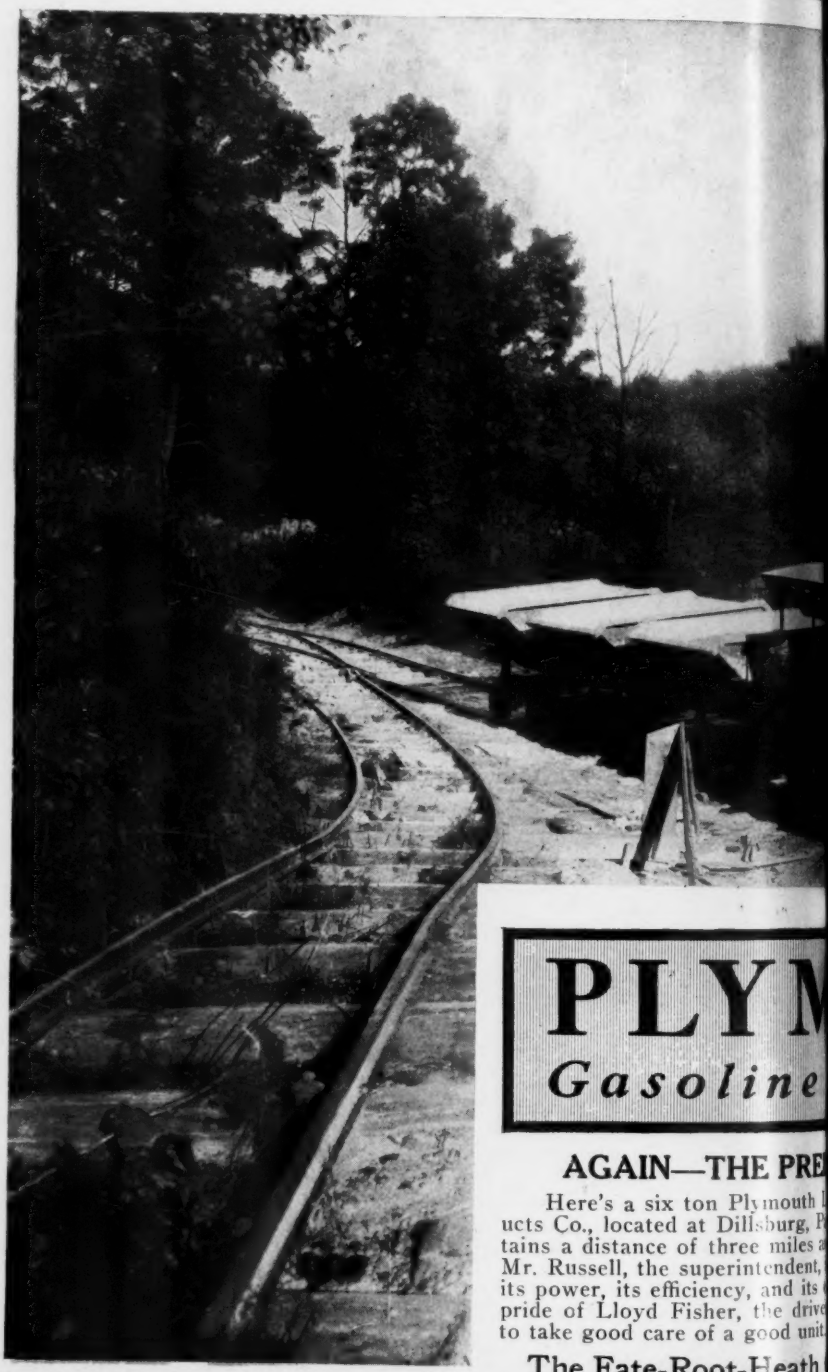


Atlas Sand, Gravel & Stone Co., Hartford, Conn.

Screening and washing plant and conveyor trestle.

Tipple and hopper above inclined conveyor.

General view showing relation of parts.



PLYM
Gasoline

AGAIN—THE PRE

Here's a six ton Plymouth
ucts Co., located at Dillsburg,
tains a distance of three miles
Mr. Russell, the superintendent,
its power, its efficiency, and its
pride of Lloyd Fisher, the drive
to take good care of a good unit.

The Fate-Root-Heath

UTH

omotives

ATING PLYMOUTH

in the plant of The Penn Prod-
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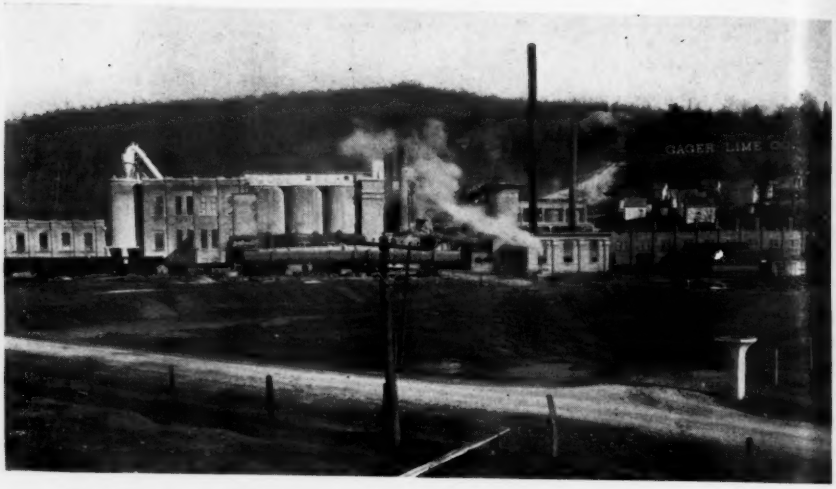
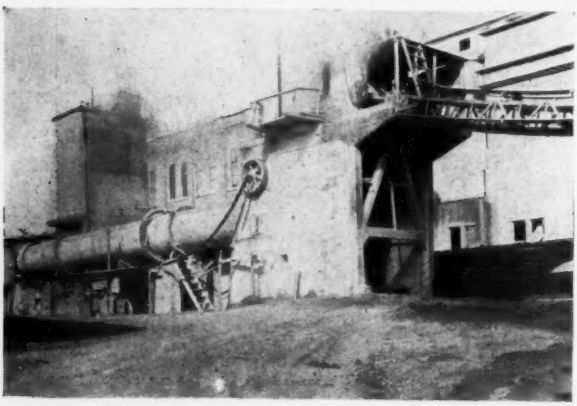
Plymouth, Ohio



View of principal part of plant. Note whitewashed sign on hill.



Charging end of smaller rotary kiln.

Picture taken immediately after drawing kilns

Gager Lime Co., Sherwood, Tenn.

One of the largest lime plants in the South, well designed and efficiently operated.

Efficient and Well Equipped Lime Plant

THE story of how the little lime plant started by Byron Gager in 1892 with two wood burning kilns, and one or two wooden buildings, was converted into the splendid electrically driven plant of today with its capacity of 275 tons of lime in twenty-four hours, would be very interesting but rather too long to attempt at this time. A description of the plant as it is, and the above statement about its simple beginning, will tell an eloquent story of good management and the advantage that comes with the employment of the most improved methods.

The buildings of the Gager Lime Company are at Sherwood, Tennessee, and comprise a modern burning plant, with large quarry and crushing equipment 275 feet above on the side of a mountain. Buildings are constructed throughout of sandstone concrete blocks, made on the premises. This method of construction is very satisfactory, as shown by the substantial structures that house the various operating departments.

The quarry face is 1,100 feet long and 115 feet high, and is worked in the shape of a crescent. From it is shot down periodically a supply of material that is almost pure calcium carbonate. Well drilling is handled by a Sanderson Cyclone drill which bores a 6-inch hole. This machine is electrically driven by a 15-horsepower motor. Blasting is found necessary about five times a year. The material is broken into suitable size by Ingersoll-Rand jackhammers. Air is supplied by three Ingersoll-Rand compressors, belt driven from electric motors, and by a steam driven Sullivan. A Hardsocg hammer is just being installed. Five-ton side dump cars are hand loaded at the face and hauled by mules, either directly to the top of the incline from where they are dropped down to the plant, or to the crushing plant that is operated in connection with the quarry. The quarry floor slopes down gradually from the face, so that the mules are relieved by gravity of a part of their work of hauling loaded cars, and are easily able to haul the empty cars against the slight grade. Forty to forty-five men are employed continuously in the quarry loading cars, driving mules, or working at the drills and crushing plant, or the friction drum which regulates cars on the inclined trackway.

Limestone crushing plant.

Reduction of stone to the required commercial sizes is handled by a No. 6 Austin crusher, fed by five-ton side dumping cars which discharge into a cast iron hopper. After crushing, the material is elevated by a Stephens-Adamson chain and bucket conveyor, operating vertically between 60 foot centers. Buckets are 14 inches wide.

This elevator discharges into a 4 foot by 18 foot home made rotary screen with three 6 foot sections. There is also a perforated metal scalping screen. The crushed product is stored in four circular bins made of sandstone concrete blocks, and having a capacity of 100 tons each. Stone is discharged at the bottom of these bins through slide plate gates. The cars of crushed stone then travel down the inclined trackway to commercial bins located at the plant and quite similar in construction to those at the quarry.

The connection between the quarry and the plant is maintained by a gravity railway, which lets down the cars by their own weight, these cars at the same time pulling up empty ones. The action is controlled by a large winding drum mounted horizontally across the track and operated by a friction clutch. About halfway up the incline there is a crossover with spring switches to permit cars traveling in opposite directions to pass one another. Above this point the system is operated on three rails, the center forming the right and left hand rails respectively of two separate sets of tracks.

When the car of stone reaches this point it is routed by a turntable to the vertical kilns, rotary kiln or the commercial stone bins.

There are eleven concrete shell vertical kilns, five steel jacketed vertical kilns each 25 feet long, the concrete having a 12 foot inside diameter, and the steel shell a 10 foot inside diameter. These vertical kilns have recently been equipped with Armstrong shaker grates. The vertical kilns are made of sandstone concrete blocks specially designed by Mr. W. R. Hoback, superintendent of the plant. These kilns narrow at the throat to 6 feet. Four furnaces 32 inch by 4 feet by 8 feet are used with each kiln, which is fired on two sides. The small kilns have a capacity of ten tons per twenty-four hours operation; the large ones have a capacity of twelve tons for a like period. Coal is used for firing.

The vertical kilns are supplied with coal by a guy derrick with a 60 foot mast and a 50 foot boom. This is operated by a 3 drum Clyde hoist run from a 35 horsepower motor. With this equipment, to which is added a ¾ yard Hayward clamshell bucket, coal is picked up from the stock pile and passed direct to five kilns within reach of the derrick. The other vertical kilns are served by coal carts.

Every three hours half of the kilns are drawn. This operation is entirely a mechanical one. The lime is taken out by a continuous hot lime conveyor, 25 feet in length, which delivers the output to a concrete cooling floor.

After the lime has remained on the floor a sufficient length of time to cool thoroughly, the core is removed from each lump, and the lime is delivered through grates in the floor to a pan conveyor which runs in a tunnel underneath. This conveyor passes the material on to a cross chain feeder which supplies a No. 2 Sturtevant Open Door crusher, adjusted to reduce to ¾-inch. A Stephens-Adamson elevator then takes up the lime and passes it to a bar grizzly, which makes a separation of ½-inch. The lime that passes this grizzly meets at this point lime that has come from the rotary kiln and this combined output is routed through the hydrating plant. All that is rejected by the grizzly spaced at one-half inch is passed to bins of 1,000 tons capacity where it may be loaded into cars in bulk, or packed in barrels. This method of storage has been found to be very satisfactory, the sandstone concrete block bins having held lime for a year in perfect condition.

The product is removed from storage by a screw conveyor from which

cars are loaded direct, or barrels packed by means of suspended scales. A feature of the operations at the Gager lime plant is that barrels are loaded with exactly 180 pounds of lime, not approximately that amount. This is accomplished by controlling the flow of material through a beam which tips when the required quantity of lime has been run into a chute. After the tipping of the beam, the flow is stopped and the lime dropped into a barrel.

The hydrating plant is supplied by the fines from the vertical kilns and by the entire output of the rotary kiln. At present there is at the plant a Ruggles-Coles kiln 60 feet long and 66 inches in diameter, and a larger kiln 100 feet in length and 78 inches in diameter, is on the ground but not yet put into operation. The smaller has a capacity of about 40 tons during twenty-four hours operation. The larger will, in the same length of time, turn out 50 tons. These kilns are supplied with stone one inch and under and operate at approximately one revolution per minute from variable speed, direct controlled motor. The kiln is fed by a belt conveyor 24 inches wide running from a bin which is supplied direct by cars from the quarry.

The rotary kiln is fed by coal which is passed first to a Williams mill and then to a large concrete storage bin which supplies an Aero coal pulverizer and pulverized coal burners.

The output of this rotary kiln meets the supply from the vertical kilns after it has passed the grizzly, and the whole is passed on to a No. 1½ Sturtevant mill.

The recrushed lime goes next to the hydrators of which there are three, two Clyde batch hydrators, and a Schaffer hydrator which has a capacity of 200 tons a day. A poidometer installed directly ahead of this last piece of equipment accurately portions out the correct amounts of lime and water and keeps passing the material on to the hydrator. A Sturtevant mill and set of Newaygo screens are used for pulverizing and screening the output of the Clyde hydrators. The product of the Schaffer is handled by a Raymond air separation system. The finished material is then passed on to two 200-ton hydrate bins, under which are two 4 tube Bates valve packers. Besides the bagged hydrate the company also puts up hydrated lime in 10 pound packages, packed eight to a box, for garden and sanitary purposes. A good many of these 10 pound packages are sold through the wholesale grocery houses, who distribute them to retail grocery men.

The Gager Lime Company puts up a very distinctive package. Bags, boxes, and barrels all carry the company's trademark in blue, and barrels are further distinguished by blue metal hoops. The appearance of these barrels trimmed with the colored hoops is very attractive.

In connection with the plant there is a large and very complete cooper shop, in which the barrels used for the product are made complete. The most modern cooperage machinery is installed and the shop with its daily capacity of 1,000 barrels is a big factor in the securing of steady, uninterrrupted shipment of lime.

At the present time there is storage space for 3,000 barrels, 3,000 tons of sacked lime, and 5,000 boxes of 10 pound packages, over and above the bin space for lump lime. This space will be adequate when the new rotary kiln is put in operation, and the company's capacity will be increased by 60 tons a day.

The power for the plant is furnished by a 300 h.p. Stirling boiler and two 100 h.p. tubular boilers made by the Walsh and Weidner Co. of Chattanooga. From this is fed a Curtis steam turbine at a speed of 3,600 r.p.m., op-

erating at 100 pounds pressure, turning over the General Electric alternating current generator, and the small direct current exciter, which furnishes 36 amperes at 125 volts to the generator. A belt driven General Electric generator is kept as auxiliary equipment. This is driven by a 13x20 engine made by the Houston, Stanwood & Gamble company of Cincinnati. The water supply is secured from a reservoir fed by a spring on a hill.

The officers of the company are: Byron Gager, president; D. B. Gamble, vice president; M. P. Kenney, secretary; J. M. Gager, treasurer and purchasing agent, and W. R. Hoback, superintendent.

Repair Shops

TOOLS and machinery have become so essential to the pit and quarry industries that ample provision must be made to keep them in order and make the necessary repairs. For this purpose some few operators have provided repair shops while many only have a crude blacksmith shop.

Plants located in or near a large city can easily have repairs made cheaply and quickly, while those off in secluded places or in rough mountainous country must have their own facilities for making repairs. Thus in most cases there should be a shop not only to work metals but also wood and other materials.

It is intended to give some ideas as to the tools that should be kept on hand and what machines should be installed and how such shops should be arranged.

Much work can be saved in shops by keeping on hand a fair supply of spare parts and other things necessary to make quick repairs. This is not only cheaper than trying to make many things or having them made locally, but means the saving of much time in preventing delays in the operation of the plant.

First of all it should be kept in mind that machinery can be used to its limit but should not be abused. Therefore it must be kept in repair, nuts and bolts must be kept tight, cotter pins and keys kept in place and securely fastened, and above all a machine must be kept well lubricated.

To handle repairs properly there should be a storage room to keep spare parts, and such things as bolts, nuts, pipe fittings and many other supplies. In a small operation such a store room can be made part of the repair or blacksmith shop, but for large operations it is well to have a separate building or room, close to or adjoining the shop. Do not have several places for the storage of tools, repair parts and supplies. If a tool must be used elsewhere see that it is returned promptly.

Miscellaneous supplies and parts should not be kept in a box or a single compartment, file or bin. It will take time to find what is wanted when the need occurs and frequently the article desired will be overlooked. Instead it is well to have each kind of a spare part, if small, stored in a separate compartment, and if large it can be hung on the wall of the store room or placed in some place where it can be easily seen. Pipe fittings, bolts, nuts and many similar articles should all be stored according to their kinds and sizes in small compartments or upon shelves and the various sizes plainly marked in some conspicuous place.

It is also possible to mark at the same place the number of pieces on hand and to mark off those that are used and add to the number when new ones are purchased. Thus there is always a record of the number on hand and the supply can be kept ample for all emergencies.

In arranging for spare parts of ma-

chines it is necessary to either obtain lists of such parts or a catalog containing such lists from the manufacturers and from these order one or more of all parts that are likely to be needed. It is also advisable to know the manufacturer's number of each machine, so that this can be used in ordering parts as well as the letters and numbers used by the manufacturers on the parts themselves.

In quarry operations there are likely to be more extensive shops and a greater number of tools needed than in sand and gravel operations, but today many of the last named plants use a variety of machines that are large and complicated.

The basis of all repair shops in these industries is a blacksmith outfit, but beside this should be the equipment and tools to work in wood, also leather, wire, pipe work, steel and also for painting.

Not every tool described or mentioned or machine listed will be needed in every shop, but all of them are meant for such work, and an operator must decide for himself the tools and machines to be purchased. In small operations preference should be given to those tools most frequently and urgently needed, leaving out those used but rarely. A larger organization can afford to have on hand every tool it may have possible use for and also machines that are used only from time to time.

The simplest wood working tools are the hatchet, saw and hammer. An axe can be classed in with hatchets. Nearly every one is familiar with axes. Those best adapted to repair work weigh from 4 to 5 pounds. There is likely to be work for more than one or two axes, but these being used in a general way are not likely to be in good enough condition for repair work so it is advisable to keep at least one axe reserved for such purposes.

A broadaxe is needed, in case heavy, rough logs must be hewn into shape. With the ordinary axe and a broadaxe any hewing can be done. For fine finishing work on heavy timbers a foot adze is used This is an edge tool that must be handled with great care.

Of the hatchets there are three kinds. The hand ax is a heavy, large hatchet modeled after the broadaxe and like it is used to rough out timbers with one hand. A regular hatchet is shaped somewhat like the hand axe. It and the half hatchet are very serviceable tools, but the preference is given to the half hatchet not only as a cutting tool, but also as a hammer. There are a number of different kinds of half hatchets designed for special work.

The hammer used for wood working is meant mostly for nail driving and drawing nails and is known as a claw hammer. Each manufacturer will vary his design and shape slightly from others, but the essential feature is to get a well shaped claw for pulling nails and a good head for driving.

Hand saws are of many kinds but the great distinction is that of a cross cut saw with V-shaped teeth and a ripping saw with slightly different shape and coarser teeth. According to the size of the teeth, saws are classed under numbers. A No. 7 cross cut is meant for ordinary rough boards while a No. 11 will do for finer work. In selecting saws one must be guided by the work that must be done.

A compass saw, sometimes known as a "key hole saw," must be kept for cutting curves, etc.; or for starting saw cuts from an auger hole in the center of a board.

For very heavy timbers there must be two-handed cross cut saws.

The next tool of importance is a carpenter's square. The ordinary one is a steel tool with a 6-inch arm

and the other arm 16 or 18 inches long. It is surprising how many things can be laid out with a steel square. There have been a number of books published on the uses of this tool.

Some medium sized squares may also be needed as will a bevel square, a device that will admit of one arm being set at any angle.

A draw knife is an essential as is also a spokeshave or scraper for finishing off certain things as spokes and handles.

A jack plane is also used for the same purpose, or to hustle up the timber so as to use a smoothing plane, of which there are a number of different kinds and sizes.

For cutting there must be a number of different sizes of chisels. To use them wooden mallets must be furnished for driving.

There must be a brace and a set of bits for all sizes of bore holes desired. The brace should preferably be a ratchet one, so as to bore in confined places. The bits should run up to at least 1½-inch and there should be some gimlet bits for small holes. Anything over 1½-inches should be used as an auger and have either a T handle put on it, or a crank handle made of round iron. For heavy green timbers a ship auger should be used. An expansion bit should be used for odd size holes, as it can be changed and set within certain limits. If wagons and carts are used there should be some spoke augers for fixing spokes.

A screw driver bit should be used with the brace, but there should also be provided several sizes of the ordinary screw drivers for general work.

Mr. J. C. Kohler, extension engineer of the Wisconsin Mineral Aggregate Association, has resigned from the association, and taken the superintendency of construction for the Jacobus & Winding Co.

Inclines Into Pits

A READER asks one of the editors of PIT AND QUARRY as to the advisability of using an incline operated by a hoisting engine to take cars into and out of a quarry.

In some cases an incline is absolutely necessary, for there may be no other way of operating a pit quarry.

The limitations of an incline are numerous and evident. With a single track, one car cannot come up until the first one goes down. Even with two tracks the number of cars handled over the incline are limited, and with three or four tracks on the incline it is difficult to keep more than the number of cars for which there are tracks on the move.

Another objection to inclines operated in this manner is that some other means is required for transporting the cars in the pit and if necessary from the incline to the plant on the ground surface. This means the loss of time changing from one kind of power to another and also the added cost of having the different kinds of equipment for transportation.

It is much better to go down into a pit, if it is possible to do so, on such a grade that trains of cars can be operated upon it, or automobile trucks. Trucks have been used but little for this purpose, carrying pit products from the ledge or bank to the crushing or screening plant, but they can be operated over heavy grades, up to 8 and 10 per cent, and for short distances even steeper grades, carrying a fair load.

Trains can be used on grades of 3 per cent economically, that is carrying a large tonnage at a fair speed Grades even greater than 5 per cent can be used, and if a geared locomotive is employed even heavier grades can be climbed with a train of cars

Thus, it is evident that grades can be laid down so that in 500 to a 1,000

feet from the plant a depth 15 to 30 feet can be obtained and with a longer incline a much greater depth can be reached.

If the deposit covers considerable area, it is much better to develop a pit of some length that can be economically evident, than simply to develop a round hole in the ground as a pit. To do this means to build a timber incline, while if a grade for a train or a truck is excavated in the solid rock or upon the gravel, this gives a solid road bed that will cost little to maintain.

Soapstone Production

Bureau of Mines Has Made Extensive Study of This Material

Probably as much as 80 to 90 per cent of the soapstone quarried in the United States is waste, the Bureau of Mines declares as the result of a study of the production and utilization of this material, just completed. Soapstone waste has not generally been utilized, but it may be feasible, through grinding the material, to produce a substitute for low-grade talc.

Soapstone, properly speaking, is a massive rock, whose chief mineral component is talc, usually present in sufficient quantity to give the rock a soapy feel. The term soapstone is sometimes incorrectly applied to massive talc. The composition of soapstone is exceedingly variable and its talc content may be as low as 50 per cent. In fact many soft, easily cut rocks in which chlorite predominates over talc are loosely called soapstone. Ordinarily a soapstone of good quality contains in addition to talc, varying amounts of chlorite, tremolite, pyroxene, magnetite, quartz, calcite and dolomite. Soapstone is greenish or greenish gray in color. It is characterized by its soapy feel and by ease of sawing into slabs or structural shapes, high electrical resistance, resistance to heat and to acids, and slow radiation of heat.

The great bulk of the world's production of soapstones comes from the United States, which, in 1920, according to the United States Geological Survey, produced 24,175 short tons, valued at $740,197. A very large portion of the United States production comes from one company in Virginia. A small production of soapstone has come in the past from Vermont, Maryland, North Carolina, Rhode Island, and New Hampshire. Soapstone has been quarried for centuries by natives of India, China, Brazil and other foreign countries for the manufacture of crude utensils such as bowls, pots, etc. In the United States Indians used to quarry soapstone and from it fashion various utensils. In later years deposits have been worked in many States to obtain soapstone for local use for foot warmers, fireplace lining, etc.

All soapstone deposits worked for slab soapstones are operated by open quarrying methods, the Bureau of Mines found. A few small companies remove the stone from the ground by drilling and blasting, but as this method tends to shatter the rock and destroy many good blocks its use has been abandoned by large and progressive producers. The aim of soapstone quarrying is to produce large, sound, rectangular blocks with a minimum of waste. The problems here then are almost identical with those of marble quarrying, with the exceptions that soapstone is usually softer than marble and that no account need be taken of the figures or patterns that add to the value of polished marble. The methods of quarrying, handling, sawing, dressing, rubbing and polishing of soapstone therefore follow very closely those used in the marble industry.

In the past soapstone has been used extensively for pots and kettles, stoves, fireplace linings, foot warmers and for firebrick and is still so utilized to some extent. However, the principal uses today are for laboratory sinks, hoods and table tops, acid resisting tanks, kitchen sinks, laundry tubs, laboratories, structural purposes, electrical switchboards, griddles, heating stones for fireless cookers, and as cores for electrical heating elements such as electric flat-irons.

Ground soapstone is used to some extent in foundry facings, as a lubricant, as a dusting agent in making prepared roofing, in low grade paints and for a few other minor uses as a substitute for low-grade talc.

Big Illinois Meeting

Aggegate Producers Accomplish Many Things in One Day Session

In a meeting held on March 16th, at the St. Nicholas Hotel, Springfield, Illinois, the Illinois Concrete Aggregate Association again proved to its own satisfaction, and the satisfaction of all outsiders who were privileged to attend, that it is one of the livest associations in existence, and that it is continually operating along constructive lines.

The morning session was opened by the president, Mr. Burton H. Atwood, and the roll call by the secretary, Mr. John D. Pierce, found 17 members present. Four or five others came in a short time after the opening of the meeting. There was also present Mr. Cormack, of the Consolidated Company of Chicago, material distributors. Mr. Cormack is also president of the National Builders' Supply Association. Mr. Yeoman, secretary of the Indiana Sand and Gravel Producers association, was also present. After the reading of the minutes of the last meeting and the approval of these, the membership entered into a lengthy discussion on recent happenings in the industry and particularly within that part of it which is represented by the Illinois Concrete Aggregate Association. At the termination of this discussion, the membership adjourned for luncheon which was served on the same floor of the hotel that the meeting was held on.

The afternoon session began at 12:30, with the introduction by the president of Mr. Clemmer, the gentleman in charge of the testing laboratory of the Highway Department of the State of Illinois. Mr. Clemmer's talk proved quite interesting and instructive, for in it he outlined the work that has been done by the testing laboratory. Mr. Clemmer answered a number of questions of Mr. Johnston and Mr. Schaaf, and concluded his remarks with the promise of close cooperation to any member of the association who might desire assistance in the testing of materials.

Next followed a few remarks by the president, on the importance of the association in the gravel production industry of Illinois. Mr. Atwood referred to the facilities offered by the association for economical distribution of the product, drawing attention to the fact that in at least one section of the state, the Northern, 75 to 85 per cent of the tonnage was produced by association members. This talk proved a fitting introduction to the topics covered by the next speaker, Mr. Sheets, Illinois State Highway Superintendent.

Mr. Sheets' talk informed those present that the state Highway Department was anxious to co-operate in every way with material producers to the end that aggregates of proper quality and in the necessary quantities could be supplied for the very extensive road building activities contemplated by the State. At the conclusion of Mr. Sheets' address a number of the members made comments on a few of the topics touched upon, incidentally giving Mr. Sheets a new outlook on some of the producers problems, and on the anxiety of the membership in general to cooperate to the best of their ability.

The program of the meeting next called for the appearance of Mr. Slater, transportation rate expert of the Illinois Commerce Commission. Mr. Slater, however, was unable to get to Springfield in time for the meeting, and his absence was greatly regretted, particularly in view of the fact that it was expected he would have some definite information in regard to the effect of the Supreme Court decision on "intrastate vs. interstate control of foreign rates in Illinois."

Next was introduced Mr. Cormack, who gave the views of a man outside the industry on the importance of co-operation in carrying forward the work that the members of the association have individually set themselves to perform. Among other things Mr. Cormack said:

"In the association work that I have been doing during the past number of years there is something that is one of the greatest mysteries to me, a greater mystery, in fact, that the mystery of 1,000 different religions. This great mystery is the inability of apparently sane, sensible men to see that their own financial interest, which carries with it their personal happiness, is bound up in their ability to pull together in what might be called an intelligent selfishness.

We know that instead of our customers and ourselves feeling that we are bound together by the strongest ties of self-interest, there has crept in a feeling that we are antagonistic one to the other and it is only by association work, such as this, it is only by a policy of forgetting little petty details and standing united upon the one grand object ahead, determined to build up your individual trade associations, that we are going to be able to accomplish the things I have said."

The next important topic talked upon was that of compensation insurance and the buying of insurance for the membership by the association. Particular reference was made to coverage for employees working on barges and at other water operations. A letter from an insurance company promising coverage for men in these lines of work was read. This included also operations on navigable streams, even when these streams are on the border of two states. This whole question is, therefore, satisfactorily settled.

The next important discussions were on the lien law and the question of personal bonds for road contractors. As both of these topics are of the highest importance to the aggregate producers, the discussion was quite an extended one, and undoubtedly productive of much good for those who heard. The Illinois law on liens is quite a complicated one, and difficult of application. To put it in operation in any particular case requires considerable time and much effort. It's a very hard and slow process to get satisfactory settlement under the terms of this law and many appearances are necessary to get action on public work. The experiences of a number of producers were set forth, and the general opinion was that action should be taken to provide a satisfactory method of collecting on contractors doing public work. Definite action was deferred, pending advice.

Allied to this discussion was that of the filing of personal bonds by highway contractors. It goes without saying that members would prefer bonds issued by one of the large firms in that line of business, since they, as well as the contractors, risk considerable sums of money on which they would like to have some protection.

The next item of business was the electing of an executive secretary for the ensuing year, Mr. Pierce's term expiring on the first of April. The action of electing a secretary drew forth quite general expressions of opinion of Mr. Pierce's work, and hearty commendations of his capacity and fitness. At the conclusion of the talk, Mr. Pierce was re-elected on terms more satisfactory to himself than the former ones.

Then came a lengthy discussion on the method of paying dues. The resolution finally adopted was as follows: "Resolved, that the dues of the members for the current year shall be determined by multiplying the Illinois tonnage of that member for the preceding year, by the fixed rate per ton. The amount of annual dues thus obtained shall be divided into twelve equal parts, to be paid monthly in advance." Thus the Illinois Association secures for itself a steady income even at those times of the year when tonnage of members is light.

Considerable time was next devoted to relations of the Illinois Concrete Aggregate Association to the National Association of Sand and Gravel Producers. After this followed an enlightening talk by Mr. Yeoman, secretary of the Indiana Sand and Gravel Producers Association. Mr. Yeoman's talk drew forth considerable applause, which may be understood as indicating accurately the impression made upon those present.

The time was next devoted to a discussion on open specifications. Stone and gravel producers participated freely. Mention was next made of the fact that the Executive Committee has provided for the secretary a membership in the Old Colony Club in Chicago. This is for the convenience of association members who have no office in Chicago. Reference was also made by Mr. Atwood to the situation in the Chicago district, and the prevalent practices of attempting to dump all surplus material on that market.

Members were advised that an automobile would be provided for a trip out to the Bates test road, located about 12 miles from Springfield, where road materials of all kinds are tested out under all conditions. After a few more small items of business had been taken care of the meeting adjourned.

Active Season Certain

Eastern Situation Promising—Producers Making Ready for Heavy Distribution

By Our Eastern Correspondent

There is a quickening aspect in the sand and gravel markets in New York, and the anticipation of good spring trade in the industry is giving way to a definite certainty that there will be an active movement of materials as soon as the weather is settled. Broken stone and affiliated rock materials also stand in favor for productive activity during the coming weeks, while lime products and other kindred specialties, used directly in the building trades, already are in firm demand.

The building industry at New York and vicinity is reaching a high point of operation, with about three-fourths of the activities devoted to dwellings and apartments. The material market is reflecting the situation with decided price firmness in basic commodities, and with tendency towards higher levels in the case of cement and other products. Dealers are stocking up in preparation of immediate forthcoming business, and producers are now receiving sizable orders from this source. Direct sales with contractors also are good.

Sand and gravel producers in the Long Island and New Jersey districts are making ready for heavier spring distribution, and each week finds larger shipments to the New York market and other sales points. There is good uniformity and stability in prices.

In the wholesale trade, sand is quoted at $1.00 a cubic yard in carload lots, as against a level of $1.25 at this time last year. Retail dealers are asking $1.80 for the material delivered. High grade white sand shows no change from the delivered price of $5.00 a cubic yard.

Good grade, washed gravel is priced at $1.75 a cubic yard in the wholesale district, both ¾ and 1½-inch sizes, a decline of about $1.25 from the figures prevailing in the spring of a year ago. The supply yards are filling orders at varying prices ranging from $2.75 to $3.25, delivered, depending upon quality and length of haul.

Crushed stone continues at $1.75 to $1.85 in wholesale quantities, both 1½ and ¾-inch sizes, f. o. b. city. The higher quotation at the moment is the more popular one, and contractors are making quotations on the latter basis. Dealers are asking $4.00 for crushed stone, delivered on the job, Incoming orders indicate a much heavier movement of material in the early weeks to come.

Portland cement has taken an advance in the wholesale market from $2.20 to $2.30 a barrel, and practically all cargo-lot orders are now being made at the latter figure. In the retail market, there is no change in the $2.80 per barrel level, with rebate of 10 cents a bag prevailing. The price situation, as a whole, has a steady aspect, and with advent of spring business, the market, unquestionably will show improvement.

Current warehouse prices on lime show $12.50 a ton for common lime, and from $16 to $16.80 per ton for hydrate finishing material. Barreled lump lime is selling wholesale at $3.68 to $4.00 for finishing stock, and from $2,75 to $3.50 for common lime. Finishing material is priced at $4.50 for the standard 300-pound barrel at the local supply yards, and common barreled stock, same sized container, $3.75, delivered. Hydrate finishing lime in paper bags is $24.00 a ton, retail, and hydrate common, $19.50 per ton in paper, delivered on the job.

Typical of the New England market, crushed stone at Boston is being retailed at $2.50 a ton; regular mortar sand is $1.75 a ton, and fine, white beech sand, $4.00. Portland cement is priced by local material dealers at $3.20 a barrel in paper, and $3.40 in cloth. The material is selling at $2.50 in the Boston wholesale market, as against a figure of $3.85 a year ago this same time a year ago.

The Allegany Sand & Gravel Co., Olean, N. Y., has filed notice of increase in capital from $25,000 to $50,000, for proposed expansion.

The New York Redwater Gravel Corporation, New York, N. Y., has been organized under Delaware laws with a capital of $3,250,000, to operate sand and gravel properties in this section. The company is represented by the United States Corporation Co., Dover, Del.

Bame & Cuthill, Inc., Buffalo, N. Y., has been incorporated with a capital of $25,000, to manufacture plas-

ter and kindred lime products. The incorporators are L. H. Bame, J. Cuthill and H. A. Hoffeld. The company is represented by Wilcox & Van Allen, Ellicott Square, Buffalo.

There is particularly heavy activity now under way at the slate grinding mills in the Vermont district, and a number of the plants are operating on a 24-hour basis. The quarries, as well, are very busy, and it is expected that longer production schedules will be arranged at an early date. In the mill section, it is believed that the demand during the next few months will be considerably in excess of the capacity of the plants.

The Beaumont Slate Co., Slatedale, Pa., has resumed operations at its plant, following a shut down during the winter months. The company is said to have secured a large contract, and heavy production is expected. Additional men are being employed.

The Virginia Alberene Corporation, 1511 Walnut Street, Philadelphia, Pa., has arranged for a bond issue of $750,000, to be used for general expansion, operations, etc. The company recently acquired the entire properties of the Virginia Soapstone Products Co., embracing large soapstone deposits and plans for extensive development and operations.

The quarry and buildings of the Kirschmann Sand Co., on the western slope of Mount Penn, overlooking the city of Reading, Pa., have been acquired by the Council, Reading, under condemnation proceedings and operations will be discontinued permanently. The land has been purchased in an effort to beautify the city surroundings, and the sand company, it is understood, will arrange for the re-establishment of the plant in another location. Negotiations are now under way for the acquisition of the property of the Reading Sand & Stone Co., in the same section, and it is likely that the purchase will be effected at an early date. Quarry owners on the western slope of the mountain are making an effort to retain their present holdings and to operate during the spring and summer. The Berks County Conservative Association is opposing the move. The change in properties will lead to the establishment of a number of new plants in other sections of this territory in the coming months.

The Allentown, Pa., limestone quarry of the New Jersey Zinc Co., Palmerton, Pa., has resumed operations after a shut down for 15 months past. Production has been commenced with about 25 men, and it is expected to increase this working force at an early date.

Stone quarries in the Billmeyer, Pa., district, are commencing work for spring and summer production in real earnest, and large forces of men are being engaged. A number of the plants having been operating under curtailed schedule for some time past.

The Wrightsville Stone & Lime Corporation, Wrightsville, Pa., organized about a year ago, is arranging for the permanent abandonment of operations and the company will be dissolved. The assets of the company are very small, and current liabilities are said to total $17,000. C. F. Cooper has been president of the company, and E. M. Heiman, vice-president.

Sand and gravel operations are increasing in the Pittsburgh, Pa., district, and with the opening of the spring season, there is a ggreater demand for material. Sand is selling at $1.60 a ton at the Pittsburgh river front, f. o. b., barge, and at $2.00, delivered on the water front. For material on the job, the price ranges up to $3.00 and $3.25. These quotations are quite firm and no immediate change is in sight. Washed gravel is bringing the same figures, while crushed stone varies from $2.50 to $5.00 a ton, according to size. Portland cement has declined to $2.80 a barrel, delivered, with bag rebate of 10 cents each. In the wholesale market, the material is priced at $2.00 a bag.

The Kelley Island Lime and Transport Company, Cleveland, Ohio, has recently purchased of the Allis Chalmers Manufacturing Company of Milwaukee, two No. 24 rock crushers. These crushers have a crushing capacity of 10,000 tons in ten hours, and the combined weight of the two is 950,000 pounds. An eleven car train was required to move them from Milwaukee to Cleveland.

The Pacific Lime & Gypsum Co., of Lime, Ore., is planning to erect a $25,000 structure to be used as headquarters for the company.

Cement Mill News

Items of Interest Gleaned from the Various Producing Districts

Cement production is on the increase in the Lehigh Valley section of Pennsylvania. Following preparations for the spring run, including repairs and improvements to machinery and equipment, a number of mills have been placed in service, and labor is being far more plentifully employed. The entire situation is one of decided encouragement, and even the smaller mills are arranging for active manufacture in the weeks to come.

With the uncertainty in the coal situation, there has been a general movement to stock up during recent weeks among the larger mills in this district. The Lehigh Portland Cement Co. at Coplay, Pa., has been receiving some heavy shipments of bituminous coal from the state fields, providing against plant shut down in the event of a coal strike.

With a fair demand prevailing for material throughout the winter months, as recorded in PIT AND QUARRY from issue to issue, and fine outlook for spring business, the price situation in the mill districts is satisfactory, with decided firmness in the present base. This is $1.70 a barrel, in carload lots, without bags. The mills at Universal, Pa., are asking $1.75 a barrel, on the same basis.

Road contractors in the state, as well as from neighboring districts, are commencing to make inquiries to cover their spring and summer requirements, and sizable shipments are leaving the mills for such account. Building construction, also, is making its spring demands, and prominent eastern contracts are showing strong tendency for early purchases.

At Nazareth, Pa., day and night shifts are still operative at a number of the mills. The desire to stock up is not being quite fufilled on account of incoming orders that require immediate handling. The Atlas Portland Cement Co., is operating at its Northampton plant, and the Lehigh Portland Cement Co. continues under good production at its Ormrod mills.

The Coplay Portland Cement Co., Coplay, is maintaining a good rate of output at its local mills, as is the Bath Portland Cement Co., at Bath. The Giant Portland Cement Co., is among the active producers, as are the Dexter Portland Cement Co. and the Hercules Cement Co.

The indictment charging violation of the Sherman Anti-Trust Law against the different cement interests in the Lehigh Valley section, as well as in other districts, returned by the Federal Grand Jury at Chicago, recently, has not shown any material effect in operations, and with the constant agitation along this line in recent months, it is unlikely that the situation will show any uneasiness. This is a matter that deals with the financial end of the business, and not with actual output at the mills.

William H. Mann, head of the insurance department of the Lehigh Portland Cement Co., Allentown, Pa., and paymaster for the company, died, February 28, from a sudden attack of acute indigestion. He was one of the oldest employes, in term of years, with the company, entering the organization as a clerk in 1898. He is survived by his widow and two sisters.

The Security Cement & Lime Co., Baltimore, Md., is maintaining production at its cement mills at Security, near Hagerstown, Md., and looks forward to an active spring and summer season. The company has signed a contract with the Hagerstown & Frederick Railway Co., for a supply of electric power for the operation of the plant, effective July 1, and it is believed that central station service will be far more economical than the operation of the private power plant at the works. This plant will be dismantled at the time that the new contract becomes operative. The stipulations of the agreement have not been made public, but it is said to be the largest industrial power contract ever secured by the light and power company.

Cement mills at Birmingham, Ala., have increased production to a capacity basis, due to the heavy incoming demand for material. For road work alone, it is estimated that the local mills will be called upon to furnish about 2,000,000 barrels of material during the season. The working forces are being added to, and full time schedules adopted. It is expected that all local plants will be running at maximum within the next month.

The Texas Portland Cement Co., Dallas, Tex., is arranging for the immediate resumption of operation at its mills on a full capacity basis. The company has been running continuously since 1919 under a 24-hour day basis, without a shut down, giving employment to about 250 operatives, simply curtailing production as necessary in recent months, in accordance with demand. The resuming at full blast will give employment to an increased number of workers at the mills. During the past year, the company has made improvements and extensions at its local plant, representing an investment of about $3,000,000, including equipment. The work includes three new kilns, each 220 feet long, replacing previously installed units consisting of a battery of four kilns, each 125 feet in length. The mill capacity has been increased from 2,400 to 3,500 barrels per day, or about one-third larger output. Under full production, the plant consumes about 35,000 barrels of fuel oil per month. J. A. Wheeler is vice-president.

The Pacific Portland Cement Co., is dismantling its cement manufacfacturing plant at Napa Junction, Cal., owing to the high cost of property in the immediate district and the desire to enlarge the works. It is understood that the mill will be re-established at another location.

Current mill prices for cement in some of the important districts are: Hudson, N. Y., $1.90 a barrel; Fordwick, Va., $1.95 per barrel; Kingsport, Tenn., $1.95 a barrel; Buffington, Ind., $1.70 a barrel; and Steelton, Minn., $1.75 per barrel. All for carload lot shipments.

The Wolf River Sand Company, North Memphis, Tenn, has recently purchased 150 acres of land adjoining their property, from which sand and gravel will be secured from below the surface of the ground. Many improvements and additions have been made to the plant.

The Pollard Sand and Gravel Co., Memphis, Tenn., has been organized with a capital of $100,000. The incorporators are: J. A. Pollard, C. E. Schoelch, Eugene Rosamand, T. P. McDaniel, E. O. Miller and E. R. Thomas.

Captain Dan Donnelly Passes Away

Pioneer Gravel Producer Dies in Connecticut

The death in Cincinnati on March 9th of Captain Dan Donnelly marked the passing of one of the foremost men in the gravel production industry. Captain Donnelly, who has for many years been known everywhere as "The Gravel King," was one of the first men in the middle west to recognize the importance of gravel for aggregate, and the very first to make a car shipment of washed and graded material.

Captain Donnelly was born at Goshen, Ohio, on July 31st, 1844. In his long and useful life he has seen the gravel industry begin with the first humble efforts he himself made, and culminate in the present day condition where we see the building of million dollar plants made to turn out aggregate for a well defined and evergrowing demand. Up to the time of his death Captain Donnelly was interested in these developments and in the activities of his son Harry Donnelly, first president of the National Association of Sand Gravel Producers.

About thirty years ago Captain Donnelly, then on the train service of the Baltimore and Ohio Railroad, conceived the idea that gravel was more adaptable than crushed stone to the purposes for which stone was used. He accordingly secured gravel rights on the Baltimore and Ohio near Loveland, Ohio, and began the loading of gravel direct into cars.

The work was done first with close-pronged forks, but the immediate popularity of this product soon made necessary the adoption of more improved methods. One by one were installed the prototypes of the various highly developed machines of the modern gravel plant. He acquired new locations from time to time, and built plants upon them. These various holdings have been combined today to form the present Ohio Gravel Ballast Company of Cincinnati. At the time of his death Captain Donnelly was president of this concern, but the active management of the business was carried on by his son Harry.

Frank Farrington's Business Talks

No. 4—You Are the Man!

All the time you spend wondering how the other fellow gets away with it, how he is able to do as he does and not lose his position, his business, or his reputation, is wasted time.

It counts for nothing either for you or for that other fellow.

You are the man for whose actions you are responsible.

You are the man whose success is up to you, whose business must have your attention, whose reputation is in your hands.

You don't have to worry about the way somebody else handles his business, about the way somebody else brings up his boys, about the way somebody else treats his employes.

Your anxiety about all those things should begin at home and stay there.

You are interested in the welfare of the community at large, in the welfare of your fellow men, but your responsibility in connection with those broader interests is the responsibility you should feel for your own actions and for their bearing upon other people's rights.

If you criticise others, you lay yourself open the more to criticism.

If you call attention to the faults and failures of others, you help them in no degree and you better conditions no whit.

Spreading the news of other men's derelictions does not make your community better.

It does make you worse and it does put you in rather a poor light with the people who hear you talk, even though they may express approval of your sentiments and appear to enjoy your conversation.

You can do a good deal for yourself if you make the effort to do the best you can.

You can do a good deal for others if you do the best you can with yourself.

The best you can do is good enough.

If you never do less than that, nobody will find any fault with your efforts and you will probably get out of the habit of finding fault with theirs.

You are the man whose actions you should watch and whose tongue you must control.

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Wisconsin Local Pits Defended

Construction Engineer Strong for Securing Highway Materials From This Source

We have recently received from Mr. H. J. Kuelling, Construction Engineer of the Wisconsin Highway Commission, a letter in which he takes exception to a number of statements made in our article "Completely Disillusioned," in the December issue of PIT AND QUARRY. A sense of fairness dictates that we give Mr. Kuelling, whose views differ from our own, an opportunity to state his side of the case. We are reproducing his letter herewith, and are taking the liberty of adding at the end a number of comments of our own. These comments will be found to refer practically paragraph by paragraph to Mr. Kuelling's letter.

Says Mr. Kuelling:

"We fully realize that mistakes will be made in local pit operations; also there have been mistakes made in commercial pit operations. The primary object of road work is to get as economical a road for as low a price as possible; in other words make the public's money go as far as possible. It is only with this end in view that the Wisconsin Highway Commission has encouraged local gravel pit operations in certain cases. Any idea of a subsidy for commercial pit operations is entirely out of the question.

"There have been two cases, as you state in the article, where local pits have been failures, one being that operated by the McGucken Construction Company, which we rather anticipated would be somewhat of a failure as there was a clause in the contract covering any material that it was necessary to ship in. The other was the Bates & Rogers Company, who insisted on going into a pit that we did not recommend.

"You make a comparison between the operations of the Appleton Construction Company and the operation of Mr. Joseph McCarthy on the same road. It is true these jobs were awarded at the same time, but Mr. McCarthy started long before the Appleton Construction Company and finished his job in good season. He then went to Shawano and built about 15,000 yards of city street and not the equivalent of five miles as stated in your article. The Appleton Construction Company running a local pit with a plant investment of about $13,000 did complete their job in spite of the statement in your article. They further were not hampered by rejected material, as only a very few batches were rejected in the entire five mile operation. This is from the statement obtained recently in a conversation with Mr. Koepke and his foreman. Furthermore, Mr. Koepke is absolutely satisfied with the operations and the treatment he received and is looking for another job of the same character.

"You suggest that the entire cost of the equipment should be charged to one job. This shows very little thought on the part of the writer. There might be some argument for charging parts of the equipment to a single job, but such things as crushers, hoisting engines, etc. are a very versatile equipment and can be used on other operations of the contractor. As a matter of fact, the above mentioned items are the high priced pieces of equipment.

"There was considerable discussion in the article regarding the use of washed material, which is not at all pertinent as the question of washing is determined by the quality of the material. We have both washed and unwashed commercial materials in Wisconsin and the same for local materials.

"You quote the Washington county operation as one of misjudgment wherein a drag line was first placed and later it was necessary to purchase a shovel and discard the drag line. This is very correct as to operation, but nevertheless the job was very economical and the cost of this work even with these additions and with the several hundred yards of rejected material averaged $1.01 per cubic yard of used material. This is by far cheaper than we could have built the road with shipped in material. In fact, on several of these jobs the contractors bid on both local and shipped in materials.

"On Mr. Koepke's job in Dodge county there was a saving of $29,500 by using the local material. On

Bates & Rogers' job there was a saving of $9,625, or nearly $2,000 per mile. With such figures the Wisconsin Highway Commission would be severely criticized, and justly so, if they insisted on shipped in aggregates.

"Mr. Weymouth of our department is heartily in accord with local pit operations in many cases, and only this week held a letting wherein local pit operation was to furnish the material.

"Mr. Buetow of our department, who had charge of our material investigations last year, made no such statement as you quote, that the 'saving was $14,000 on the Appleton Construction Company's job,' as the bids submitted by the contractor at the time of letting show a saving of $29,500.

"Mr. Hirst, the state highway engineer, is also heartily in favor of local pit operations, where the same furnish material of proper quality and at a saving to the tax payers of the state.

"Regarding Mr. Brodd's statement, I do not believe Mr. Brodd made any such statement that all materials should be washed, as he is not as foolish as that, as he knows that where clay and silt are not existent in sand and gravel, it is a detriment to wash it.

"Regarding Mr. Deutsche's opinion, will state that Mr. Deutsche is secretary of the Contractors' Association and is merely looking out for the interest of his contractors, and undoubtedly desires to have his contractors have as few variable items as possible to bid on. We realize that gravel production is a variable item, but where it is necessary to use the local material the contractors who do not desire to bid on it must seek work elsewhere.

"Regarding the quotation of Mr. Cheney of McCullough & Cheney, I doubt whether Mr. Cheney would do as you suggest, namely, charge the entire cost of equipment to the one operation. If he does, it is very poor business method on his part, and I think I know Mr. Cheney too well to think he would do any such thing.

"Regarding the statement of Mr. Driscoll of the Garvey-Weyenberg Company, will state that they have not had any local pit operation in our state for concrete road purposes, nor have they had anywhere else to my knowledge. As to being delayed more with local pit operations than with commercial plants, I doubt it very much as our experience has been otherwise, especially when railway operations are not of the best and there is a lack of cars.

"There is no doubt that gravel production is a business which requires specialized knowledge, but we believe a considerable amount of it required in Wisconsin operations will bring about some experienced local pit operators who can either aid the contractors themselves on the job or can furnish material to the contractors. We see no reason why the so-called commercial operators can not enter this field and operate some of these small plants themselves and make a flat price to all bidders on the job. They could do this with a proper profit to themselves."

We Are Still Unconvinced

PIT AND QUARRY heartily commends the motives of the State Highway Department and its endeavor to save the tax payer's money. We have no cause for disagreement on this score, but we are certain that, in the long run, the private pit will not save the public money, and we know, too, that many of the private pits that managed to "get by" would not have done so had they not been carried safely over certain bad periods by the commercial plants. The commercial producer asks for no subsidy, but he knows that he is the backbone of the whole material production plan, and he wants a recompense commensurate with the importance of his contribution.

At the time our first article was written we had no idea of waging war on the State Highway Department. What we set out to establish was that the idea of the private pit is not fundamentally sound. We were interested in the McGucken, Bates & Rogers and other experiences only in so far as they illustrated our contention. None can deny that they did this wonderfully well.

The amounts of work done by Mr. McCarthy and by the Appleton Construction Company respectively were just about equal. We were in error when we said Mr. McCarthy did "another" 5 mile job at Shawano. He did about 5 miles altogether. He began work earlier than the Appleton Company because he did not have to erect a plant, and he got his money earlier

because he was through earlier. At the time the PIT AND QUARRY article was written the Appleton Construction Company had not completed its job.

Figuring in purchase prices, freight charges, costs of erecting, changing locations, dismantling, depreciation, rentals, repairs, etc., we know that mighty little of the cost of a small road-side plant would be left over in plant value at the end of the season.

To answer Mr. Kuelling's argument on the universal use of washed aggregates, would mean "beginning at the beginning" and fighting the whole subject of the relative merits of washed and unwashed materials. The Highway Department apparently takes a view different from our own.

We doubt whether all the factors that enter into cost were understood and included when the Washington County pit price of $1.01 per yard was arrived at. Too frequently even commercial producers, who are in a better position to study the subject, fail to include all the items of expense that they should, and in ignorance fix a price that they believe is true, but which is really lower than it should be.

In considering savings on the Appleton Construction Company and Bates & Rogers jobs, it is well to remember that the Bates & Rogers job was not finished and that some of this profit to the state may have come out of the contractor's pocket, which cannot be considered as a permanent way of doing business. Perhaps, too, the amounts saved now will not seem so impressive a number of years hence, when the condition of roads made with local and with commercial material is compared.

There are *some* cases, as Mr. Weymouth said, where local pit operations are desirable. In this we too, of course, concur, and the letting referred to by Mr. Kuelling apparently applied to such a case.

Emphatically, Mr. Beutow did *not* say that the saving on the Appleton job was $14,000. Mr. Beutow claimed as supporting the idea of private pits that "A saving in railroad hauls of $14,000 was made." PIT AND QUARRY so quoted him.

A point brought up by Mr. Deutsche is one that we ourselves have stressed. The contractor has enough things to worry about as it is. The worries of producing aggregates should be relegated to a man qualified to assume them. There is danger, otherwise, of too many contractors "falling down," to the detriment of the road program.

The Garvey-Weyenberg Co. have not operated any local pits because, as quoted in PIT AND QUARRY, they have learned from observation that contractors who tried it have not, as a rule, come out very well.

We must differ with Mr. Kuelling in his views on the private pit and the railroad causes of the slowing up of road jobs. We believe that the private pit is a more prolific source of delay.

Two stone crushing companies, to prepare crushed rock for various building purposes, concrete work or railroad bed ballast, have just been organized in Webb City, Missouri. The Webb City Stone Company will build a $5,000 crushing mill just southeast of Webb City. Officers: Carl Steuck, president; P. Braden, secretary; R. A. Bailey, traffic manager; A. S. Kerr, superintendent. The Highway Stone Company have purchased 70 acres of land on which they propose to erect a mill costing $7,000. J. Frank Todd and Tom Walker are the operators.

The Outagamie Limestone Company, Black Creek, Wis., is making arrangements to enlarge its plant. Work has already commenced on the foundation of a large building to contain bins for storing crushed stone. The company has also ordered a pulverizer so that it can convert limestone into fertilizer.

Robbers seem to have a special pick on the cement plant of the Louisville Cement Co., at Speeds, Ind., as a second attempt was made recently to blow open and rob the company's strong box there. It is only a short time since it was blown and robbed, but only a small amount of loot was obtained.

The plant of the Northwestern Sand & Gravel Company, at Gifford, Iowa, is in the process of reconstruction, and the work is progressing very rapidly. A considerable amount of new machinery and equipment are to be added to the plant.

Dismissal of Rate Case Recommended

Examiner Hosmer Thinks Charges in Central Territory Not Unreasonable

From The Traffic World

Examiner Howard Hosmer has recommended the dismissal of No. 13231, National Association of Sand and Gravel Producers vs. Pennsylvania Railroad Company et al., on a holding that rates on sand and gravel in central territory, considered as a whole, were and are not unreasonable, unduly prejudicial or otherwise unlawful. The object of the complaint was to procure a general reduction in the road and building materials, which, according to the testimony in the commission's general rate inquiry, have been moving by truck from roadside pits instead of by railroad, to the end that the producers from more permanent plants might be restored to the markets. The dismissal, Hosmer said, should be without prejudice to any finding the Commission might make in its general inquiry. By amendment the complaint was changed so as to include crushed stone. At the hearing the complainants asked leave to withdraw their allegations so far as northern Illinois and Wisconsin were concerned.

The specific request was that the roads be required to reduce their rates immediately so they would not be more than 10 cents per ton higher than June 24, 1918. The complainants alleged that the 15 per cent increase that became operative May, 1918, the flat increase of 20 cents per ton under General Order No. 28 and the 40 per cent increase under Ex Parte 74 had so raised the rates that the complainants were put out of the market to a very large extent.

Although Ohio, Michigan and Indiana reduced the rates allowed by them after Ex Parte 74, the complainants said the reductions were wholly inadequate. They said that, notwithstanding that Ohio had wholly removed the 40 per cent increase, Indiana about 70 per cent of it and Michigan nearly one-half of it.

Examiner Hosmer said the question whether there should be further reductions was closely related to the main question in the Commission's rate inquiry, but that the complainants desired a separate disposition of their complaint because of what they deemed to be the urgent need of an immediate and substantial reduction in rates. They showed that increases in the volume of traffic followed the reductions made by the three states mentioned and said there would be a still greater movement if the rates were made such as to enable the complainants to compete with the establishments using trucks.

The reasonableness of the rates in issue, Hosmer said, could not be gauged by the ability of the complainants to engage in business in competition with local producers. Nor can the railroads be required to reduce their rates below just compensation to discourage the use of the supposedly inferior materials produced at roadside pits, Hosmer said, nor "to stimulate construction enterprises and thereby lessen unemployment, however important these objects are from the standpoint of the public welfare."

Hosmer expressed doubt as to whether the change in the law had done away with the principle that a carrier could not be required to meet competition even if the commission was required to "initiate, modify, establish or adjust" rates so as to permit carriers to earn a fair return on the value of their property. While it was admitted that there was an increase in the volume of sand and gravel traffic after the reduced rates were put into effect in the three states mentioned, Hosmer said the record was silent as to whether the gross revenue was greater or smaller. He said the Michigan roads contended there was a loss, but he called attention to the fact that the loss was based on the assumption that as great a volume of traffic would have moved at the higher rates.

An allegation of undue prejudice was based on the fact that rates on slag were lower than on sand and gravel, with which it came into competition. The carriers admitted, the examiner said, rates on slag were too low and that the maladjustment should be corrected by raising the rates on slag. He said that was their position in Ex Parte 74 and he added his approval by saying the rates on slag, formerly carried for nothing by

the railroads as part of the burden of supplying blast furnaces with raw materials for the making of pig iron, "obviously were abnormally low." He said a formal finding of undue prejudice could not be based upon this record. The complainants declared, the examiner said, they did not intend to raise any question as to conflict between the rates on sand and gravel, bringing in the question of conflict between the interstate rates on sand and gravel and the intrastate rates on slag. Acceptance of that construction of their action, Hosmer said, would make improper any finding which might result in the raising of intrastate rates on slag to remove discrimination against interstate transportation of gravel.

The sand and gravel people complained against the minimum weight on their materials on the ground they were often assessed penalties for overloading due to the fact that the minimum was held to be 110 per cent of the marked capacity of the car. In the anxiety to load to the minimum the complainants contended they sometimes were over 110 per cent, whereupon penalties promptly were assessed. They suggested 90 per cent of marked capacity as the minimum. Hosmer said, however, the complainants could easily estimate the weight of their lading and the economical use of equipment required the maintenance of the minimum.

Recent Patents

The following patents of interest to readers of this journal recently were issued from the United States Patent Office. Copies thereof may be obtained from R. E. Burnham, patent and trade-mark attorney, Continental Trust Building, Washington, D. C., at the rate of 20 cents each. State number of patent and name of inventor when ordering.

1,407,119. Electric mining apparatus. Harvey C. Berkey, Claremont, N. H., assignor to Sullivan Machinery Co., same place.

1,407,120. Mining apparatus. Charles W. Wyman, Claremont, N. H., assignor to Sullivan Machinery Co., same place.

1,407,589. Front-end construction for rotating rock-drills. Fred M. Slater, Easton, Pa., assignor to Ingersoll-Rand Co., Jersey City, N. J.

The Willmar Washed Sand & Gravel Company, Willmar, Minn., has been organized by Wm. O. Johnson, C. J. Swenson, H. L. Wadell, with offices in the Tallman Bldg. The property of this company is on the shores of Long Lake, and considerable equipment has been purchased.

A corporation with a capital of $250,000, is now being formed in Sturgeon Bay, Wis., to take over the stone quarry of O. A. Green and operate it on an extensive scale. G. A. Huck has an option on the quarry, and is now engaged in securing the capital.

Rouse and Wagner Corporation, Salem, Mass., has been incorporated with a capital of $20,000. Incorporators: Paul M. Wagner, of Woburn, George F. Rouse of Salem, and John L. Dyer of Cambridge.

Work has been started on the new plant of the Eastern Illinois Gravel Company, at Metropolis, Illinois.

The Benon Stone Company, Oak Harbor, Ohio, has been organized with a capital of $20,000. Organizers: William Lipstraw, Pearl Lipstraw, Samuel R. Curran, Carl Scheurman, and Louis Lipstraw.

S. W. Lindheimer, formerly vice-president of the Zelincker Supply Company of St. Louis, Mo., has now engaged in business for himself in Chicago, with offices in the First National Bank building. Mr. Lindenheimer will handle railroad track and accessories, also contractors' equipment, including steel sheet piling, pile hammers, compressors, hoisting engines, cars, locomotives and tanks.

The Appleton Sand and Gravel Co., newly organized at Appleton, Wis., has purchased the sand and gravel pits of the Waupaca Sand and Gravel Co., at Binghampton, Wis. This concern, which was organized with a capital of $25,000 will shortly increase this to $50,000. R. F. Whale, Waupaca, president; J. M. Balliet, Appleton, secretary.

The Bitter Lake Gravel & Concrete Company, Seattle, Wash., has been organized with a capital of $20,000. Organizers: L. S. Melsted, R. T. Pamment and L. J. Wyckoff.

Most for the Money

National Government to Put Road Making On Efficiency Basis

By Our Washington Correspondent

Research on a hugh scale to determine how billions of the national wealth shall be applied to highway transportation is being conducted by engineering societies, state and government agencies and other organizations under the direction of the advisory board on highway research, maintained by the Engineering foundation and the Division of Engineering of the National Research Council. Economics has transcended all other problems of highway transportation, it was stated in an announcement issued by the Engineering Foundation. Organization of the transportation agencies of the country so that each may preserve its proper economic relations to the others was described as the central need.

"Since a limited amount of the national wealth is available for transportation," said the statement of the foundation, "what is spent on highway transportation beyond the economic necessity will diminish the amounts that should be applied to other agencies of transportation, such as railways and electric lines. The data upon which the solution of this problem may be predicated are largely wanting. Such data result from traffic surveys and analysis of costs that arise from the road and from the vehicle. It is in this economic field that the greatest opportunity lies for useful and fruitful research. Scientific correlation of transportation agencies should replace conflict."

Figures showing enormous devvelopment of highway transportation, results of surveys showing progress in determining the proper relation of revenue to cost and suggesting that the plea of farming communities and other property holders for diminished road taxes might be met if those who use the roads were asked to pay for them were made public, by the foundation. Importance of traffic was stressed as a chief factor in devising a colossal scheme of financing. During 1921, $600,000,000 was spent on highways in the United States for state, county and other roads outside of cities, it was stated. Of this sum, $420,000,000 went for construction and $180,000,000 for maintenance.

Director W. K. Hatt, who will have charge of the research work for the Foundation, in outlining plans for this year, said that there is an important service to be rendered by the highway engineer in so locating his road that the cost of operation will be reduced, these costs including fixed charges, depreciation, replacement, maintenance of vehicle and road, etc. Marked progress is expected by engineers to be made during the coming year toward the solution of the country's highway problems.

More than $100,000,000 will be expended to build new highways and repair old ones in the United States this year, it is indicated in reports to the government. Under the $75,000,000 emergency road bill passed by Congress the Federal government will share with the States the cost of this gigantic construction program. Every State will share in the disbursement of Federal funds, provided it appropriates funds for construction work equal to the outlay of the Federal government.

The contribution of Federal government authorized during the present economic emergency, was intended to stimulate employment. Jobs for approximately 100,000 workers for an entire year each will be made available as a result of the construction campaign, it is estimated. This is on the basis of $1,000 a year per worker. Most of the money to be spent during the campaign will be poured out under the supervision of the Bureau of Public Roads of the Agriculture Department. For months officials of this bureau have been at work making the necessary preparations and plans. In many states similar activity is under way in the highway bureaus.

Bond issues to obtain money to match the Federal funds are under consideration in several states. The spring elections will bring voting on the bonds in many sections of the country. With the money in hand, the construction campaign will proceed rapidly. In the Southern States, where weather is good, work is already under way in many sections. Contractors from all sections of the United States are watching the Southern newspapers for public advertise-

ment of requests for bids on highway construction. In the North and Northwestern States the opening of the road building season occurs later than in the South, because of the heavy rains and late snows. But road contractors are beginning work indoors on plans in Pennsylvania, Maryland, Ohio, Indiana and Illinois.

What the new Federal highway appropriation to be expended under the direction of the Bureau of Public Roads, United States Department of Agriculture, will mean to the country is accurately gauged in a synopsis prepared by the bureau, showing the use to which the $275,000,000 previously appropriated by Congress has been put. Up to December 31, $212,077,246 had been put to work in projects either entirely complete or under construction. To match that amount the States appropriated $285,379,312, making a total of $497,465,558.

If placed end to end the roads to be paid for by this money would encircle the earth and extend as far as from New York to San Francisco on the second lap. The total mileage of roads under construction and completed, the department's records show, was approximately 27,000 miles. Of this mileage 9,555 miles was in projects entirely completed. The balance of 17,445 miles was in projects which were still under construction but reported 69 per cent complete October 31. In those projects there was the equivalent of 12,000 miles of completed roads, so that the completed road to date was more than 21,000 miles, or nearly enough to encircle the globe.

Prior to 5 years ago the Federal Government took no active part in the road construction of the country. Today about one-half of all roads under construction are being aided financially by the Federal government and the construction is subject to inspection and approval of Federal engineers.

Erection of a plant for washing river gravel has been begun by the Rock Island Sand & Gravel Co., at Rock Island, Ill. The company plans to spend $34,000 on equipment.

The Morgan Sand & Gravel has recently been incorporated at Long Island, New York. Capital $25,000. Directors Frank Kopp, 371 Bleecker St., and William Kopp, 11A Halleck Ave., Brooklyn, and Wm. B. Nellen, Maspeth.

The Kanawha Sand Co., Parkersburg, W. Va., will soon commence work on its proposed new sand and gravel plant at Huntington, W. Va. Plans for the buildings are being prepared by C. E. Wright, Parkersburg, architect and engineer.

The Bachman Slate Works, Slatington, Pa., has resumed operations at its plant. The output will be curtailed until it is possible to open the quarries to a greater extent.

New plant of Pennsylvania Glass Sand Co. at Kermit, Va.

Roads Wintered Well

Stone and Gravel Highways in Indiana Recently Inspected

By Our Indianapolis Correspondent

The general condition of state roads constructed of such native materials as crushed stone and gravel is excellent throughout Indiana, standing in a very creditable manner the wear and tear incident to thaw and freeze of winter, Lawrence Lyons, director of the state highway commission has announced. The statement was made following an inspection trip of 300-miles over these roads by A. H. Hinkle, chief engineer of maintenance, and under whose direction and supervision state roads were maintained this year.

Mr. Hinkle inspected stone and gravel state roads in the counties of Shelby, Hancock, Rush, Franklin, Dearborn, Wayne and Marion.

Throughout the winter, Mr. Hinkle says, his department caused these roads to be dragged and scraped as often as three times each week. Less heavily traveled roads were dragged at least once each week. This treatment, he declares, has the advantage of filling the porous places and causing the water to drain off the surface to either side of the roads. A light coating of stone and gravel often is spread by the dragging crews when it is deemed necessary to keep the surface in proper condition, he says.

Mr. Lyons explained that in a few instances some of the stone and gravel roads are cut up, a condition unpreventable for short periods during the thawing season. However, a few days of continuous dry weather will remedy this unpleasant feature, and then the supreme advantages of proper maintenance on this class of roads will be plainly discernable. That maintenance is and should be one of the strong features of Hoosier state road work is quite evident to the motorist, who after traveling a few miles on a state road that has been continuously dragged, routes over a road not included in the state system and which has not been treated to the drag with regularity.

There are 1,825 miles of gravel roads, 815 miles of stone roads and 170 miles of earth roads under jurisdiction of the maintenance department at this time, and were it not for the patrol system and the constant attention given them with the drags, many miles would be impassable when the frost is coming out of the ground, highway officials declare.

Announcement has been made that J. A. Schearer has been elected vice-president of the Lowry Nursery and Landscape Company which was organized in Indianapolis a short time ago. Mr. Schearer is president of the Indiana Gravel Company.

As the result of an explosion of dynamite, caused by the dropping of a dynamite cap near the fire, which was used in thawing out the stick of dynamite for use in opening up a shale injured by the explosion.
quarry at Limedale, Henry Keefer, age fifty-five, a contractor of Huntington, Ind., is confined to his hotel at Greencastle. Mr. Keefer was seriously

New Patented Mining Sheaves and Rollers

A number of improvements in rollers and mining sheaves for use on inclined railways operated by hoists have been made by the Chicago Mining Sheave & Roller Company. Their products are designed to increase the life of steel cable, and to act smoothly and without attention other than an oiling about once a month. The manufacturers claim for these devices that they have affected distinct economies wherever they have been installed. There are a large number of them in use in quarries and gravel operations, and in slope mines of various kinds where working conditions are quite similar to those encountered in pit and quarry fields. A type of sheave and roller is provided for light and heavy grades, straight and curved tracks and light and heavy duty, and long and short hauls. These products are described at length in a descriptive catalogue issued by the company.

Jas. Burlington of Spencer, Iowa, has recently purchased the plant of the Le Mars Gravel Co., at Hawarden, Iowa. Coburn Burlington, son of Jas. Burlington, and a young man of considerable experience in this line of work, will take charge of the plant, which will continue to be known as the Le Mars Gravel Co.

Truck License a Burden

Texas Finds It Eating Up Profits As Season Advances

By Our Dallas Correspondent

Texas gravel dealers are still much exercised over the provisions of the new state highway law that became effective on January 1, 1922, which imposes a graduated license fee upon motor trucks, depending on the load. The fees increase rapidly as the load becomes greater and make the operation of large trucks which haul several tons impractical because of the expense. The law has fallen especially upon the sand, gravel and crushed stone dealers, because the material they haul is dead weight and the greater the load the greater the profit, for the largest item of expense is the cost of delivery.

Several dealers have taken steps to make a test at law of the license fee provision, and litigation is now pending in the courts. The sand and gravel dealers claim that the operation of this law increases their cost of delivery about one-half, and as they have entered contracts for delivery of large quantities of sand and gravel under the old law, they are brought to the verge of bankruptcy by the operation of this law.

Building operations in Dallas and other Texas cities is steadily improving, much street paving and highway construction is being undertaken by the cities, counties and road districts, and as a consequence the demand for gravel, sand and other construction materials is stronger now than for some time. Dealers report they have all the business they can care for and all gravel pits in the vicinity of Dallas are being worked to full capacity.

Dallas County recently awarded a contract for the construction of 30 miles of hard-surfaced highway, known as the belt line encircling the City of Dallas and joining all the cardinal highways radiating out from the city as the spokes of a wheel from the hub. The belt line is to be of gravel and earth mixed with asphalt and is to cost about $6,000 a mile. The contract was awarded to the Rawhide Paving Company of Dallas. This Company will go into the market and purchase much of the gravel used in the construction of this highway.

The City of Dallas has also awarded several large street paving contracts, involving the expenditure of something like $300,000. The paving contracts call for the paving of Clinton avenue from city limits on the north to the city limits on the south, making a cross-town thoroughfare about two miles in length for Oak Cliff; and the paving of Beckley avenue from Neeley on the north to the City Limits on the South, making another cross-town thoroughfare for Oak Cliff. The pavement on both streets is to be of concrete with bithulithic topping, and large quantities of gravel will be used on each street.

The paving companies that were awarded these paving contracts will purchase most of the sand and gravel as well as crushed stone used from the Dallas dealers on competitive bids.

Fort Worth has also entered upon an ambitious street paving program and Tarrant County is in the midst of its road building program as called for under the agreement entered into when the $4,500,000 bond issue was recently voted. Contracts recently awarded by Dallas County, including the belt highway, comprise all the work agreed to be done with the proceeds of the $6,000,000 bond issue voted about two years ago. More than half this sum has already been expended and contracts on which work is underway or will commence soon will call for the expenditure of the balance.

Several large building projects are now underway in Dallas. The Dallas Athletic Club has begun work on its 12-story building, and the Dallas Medical Association will erect a 12-story building to be known as the Medical Arts Building. Contract has been awarded and construction work will begin in a few days. Both these buildings will be of reinforced concrete and will call for an enormous quantity of sand and gravel.

Prices of sand and gravel in Dallas and Fort Worth remain steady, and there is no immediate prospect of weakening. Gravel is being delivered f. o. b. cars at the gravel pits for $1.00 to $1.25 per cubic yard, while the product delivered on the job in Dallas ranges from $2.50 to $4.00 per cubic yard.

Spring Opening Well

Louisville Expects Good Business in Spite of Freight Handicaps

By Our Louisville Correspondent

THE Spring season is opening up very propitiously for the sand and gravel people in the Falls Cities and the outlook is good for the quarry people so far as road construction work is concerned. There is still the handicap of high freight rates hampering the commercial quarry work and the ground limestone business. More favorable freight rates would make it practical to develop during this year quite an interesting trade in ground limestone but until we get better freight rates both the ground limestone business and the commercial quarry business will remain seriously handicapped. The road building outlook is splendid and this speaks well for both the local quarrying business and the sand and gravel business.

The sand and gravel people are getting busy early this season and on the whole are looking forward to a busy spring and summer. The local building prospects are starting off early and the carload shipping trade in sand and gravel is doing as well as could be expected for this time of the year.

The Ohio River Sand Co. had to start its diggers out on the river a little earlier than usual this season because they were running short of stock in their yards here. They started out the 22nd of February with their digger and though at this writing high water is interfering some with river work they are in very good shape to meet the current needs of the trade. Also their battery of six new five-ton Pierce Arrow trucks is rendering good service and they feel that they made no mistake in buying them. Secretary Settle of the Ohio River Sand Co. says that while the spring trade has not yet attained full volume the outlook is fairly good and with the starting of street and road work they should be keeping fairly busy.

R. B. Tyler, Secretary of the Kentucky Crushed Stone Association, says they have not set a date yet for the Kentucky meeting, but they expect to get together soon now. Meantime the quarry folks are getting into harness and beginning spring operations. There is not much commercial business owing to the high freight rates, but those with railway contracts and highway contracts are getting into action. Mr. Tyler is starting up three of their quarries furnishing material for road work but has not yet started up the local quarry here.

W. J. Sparks, Mount Vernon, Ky., is

R. B. Tyler

starting up some of his quarries and includes in his operations this year a new quarry plant at Madisonville, Ky. In fact a number of plants are reported as getting into operation now in connection with railway and highway work. In a word spring is here and the quarry folks are getting busy.

The E. T. Slider Co., with yards both in Louisvile and on the New Albany side, planned to start its jumbo digger out about the middle of March, but was delayed some with repairs. And it was perhaps fortunate that they were, because the high water came the middle of March to interfere with river digging operations. They are fortunate enough to have a supply of sand and gravel in their yards to serve the current needs therefore had no urgent call to start river operations unusually early.

J. E. Lloyd, manager of the Louisville yard of the E. T. Slider Co., says that there has been a fairly good volume of early carlot trade with dealers throughout the state and that

they look forward to being kept pretty busy as soon as street and road construction gets actively under way.

Not only is there quite an active good road building program on in Kentucky but there is quite a lot of street and alley work being done in Louisville, and in addition to this building operations so far this year are considerably ahead of last year, and it looks like good times ahead in the sand and gravel business.

Over on the Indiana side the board of commissioners of Madison township awarded to A. B. Krempp, of Jasper, Ind., contract to build some free gravel roads in that township, the total contract amounting to $42,951. Hendricks & Mynatt of Cuzco, Ind., got the contract for roads in Hall township for $13,400.

The Kentucky legislature just before adjourning passed a bill which prohibits the employment of convict labor in road construction work but permits the employment of such labor in quarries provided the quarries are surrounded by stockades.

Not Allowed to Save Money

Announcement is made that the stockholders of the Wallingford Stone Co., are about to close up its affairs and cease to continue its corporate existence. The present stockholders are Winslow B. Dickerman, Harry E. Dickerman and Charles Loucks, and according to the announcement a period of four months is assigned for the presentation of claims against the corporation. There is a story connected with this corporation that might be told now in view of the fact of its approaching dissolution. When Wallingford started its program of street paving on a large scale, a number of citizens, most of them then holding public office in the Town or Borough, conceived the plan for the formation of this company. The purpose was to furnish stone for road building to contractors who might be awarded contracts for that work at a cost less than it could be procured from any of the large producers. The corporation was duly organized, and operation commenced on the face of the cliffs on the east face of Mount Tom on the property owned by John F. Downey.

The capital stock of the corporation was fixed at $10,000, the paid-up stock was about one-half of that amount, bins were erected, and a large crusher purchased and operations commenced, and for two years, more or less, during the time that road work in the borough was in progress on a large scale this company furnished its product at from twenty-five to fifty cents per ton cheaper than the like commodity could be procured elsewhere and it was at that time estimated by competent persons that the Wallingford Stone Co. saved to the taxpayers of the Borough of Wallingford a matter of several thousands of dollars. Most, if indeed not all of the stockholders in the corporation at that time were public officials, such for instance as John E. Martin, warden; William A. McKenzie, superintendent of the Water Works; Winslow B. Dickerman, borough treasurer; Charles Loucks, member of the board of burgesses; John P. Bridgett, borough clerk, and C. F. Drum, tax collector.

Matters progressed with a reasonable degree of satisfaction to the public, of course, the stockholders received no profit from the operations of the company, and in the borough election following the organization of the company the leaders of the local wing of the Socialist party caused to be printed and distributed a campaign dodger in which they charged the stockholders with criminal acts in that they had sold the products of their crusher to the borough while they still held public office. The result of this unwarranted attack was that every one of the stockholders who were in office at that time concluded to dispose of their holdings and quit the company.

Little if anything has been done over on the hill since that time, and now the corporation that was brought into existence for the purpose of assisting the borough to build its roads at the lowest possible cost is about to pass out of existence. It may be said that it served the purpose for which it was created, that it helped in a substantial way to make for a considerably large extension of road building. But its originators have always felt that had it not been for the destructive propensities manifested by the leaders of the Socialist party in Wallingford it could have been of considerable more value to the people of Wallingford and could have made possible still further extensions of road improvement here.—*Meriden (Conn.) Journal.*

Fluorspar Industry in 1921

The fluorspar shipped from mines in the United State in 1921, according to Hubert W. Davis, of the United States Geological Survey, Department of the Interior, amounted to approximately 35,600 short tons valued at $708,000, a decrease of 81 per cent in quantity and of 85 per cent in value as compared with 1920.

The general average selling price per ton f. o. b. cars at shipping points for all grades of fluorspar in 1921 is estimated at $19.89, which is $5.37 less than the average price in 1920.

The total shipments in 1921 were the lowest recorded for any year since 1908. The shipments from Kentucky exceeded those of Illinois for the first time since 1904.

The stagnation in the fluorspar industry in 1921 was due principally to the curtailment of operations in the industries that consume fluorspar, although even if reasonable activity had prevailed the demand for fluorspar would have been small, because the aggregate stocks in the hands of users on January1, 1921, were the largest that had ever accumulated—sufficient to meet normal requirements for about six months.

The imports of fluorspar into the United States in 1921 showed a decrease of 75 per cent in quantity and of 74 per cent in total value as compared with those in 1920. The imports in 1921 were equivalent to about 22 per cent of the domestic shipments of fluorspar of fluxing grade, as compared with about 16 per cent in 1920. The value at the foreign ports of the shipments made to the United States in 1921 averaged $11.13 a ton, a slight increase over that in 1920.

Saving Coal

One method of conserving coal in boilers is the simple expedient of keeping water in the ash pan under the grates. Enough water should be there to keep the body of ashes more than damp. Thus the heat from the fire slowly converts the water into steam and this steam furnishes some oxygen to the fire so that real CO_2 combustion can take place. This means a larger water evaporation from the same amount of coal, thus conserving fuel. The steam also helps to keep the grates cool, provided ashes are not allowed to accumulate in the ash pan. The hot ashes falling from the grate into the water are cooled immediately. The water on the ashes also prevents much dust from arising when the ashes are shoveled. The water can be dashed into the ash pan by means of a bucket, or be sprayed over the ashes with a hose.

It is for the same reason that an exhaust steam pipe is run under a grate and allowed to discharge there.

Catalog of Osgood Equipment

Catalogue No. 122 of the Osgood Company illustrates quite completely the full line of Osgood shovels and cranes. Beginning with smaller models which are shown performing various kinds of work to which a steam shovel is put, and illustrating the use of various types of buckets, the book takes up a discussion of the larger machines, including big Osgood 120, a machine which operates a 6 cu. yd. bucket.

All fields of activity are covered in this book, and the various features of the Osgood well set forth. Between those sections of the book in which the larger and smaller pieces of equipment are described are a number of pages that illustrate and explain some of the principal Osgood features.

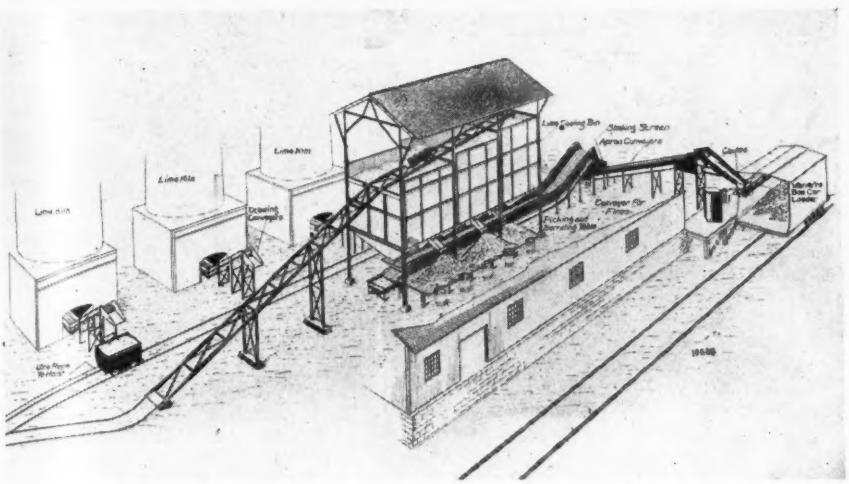
Copies of Catalogue No. 122 may be had by addressing the Osgood Company at Marion, Ohio.

The Acme Sand & Gravel Co., 801 Emerson Tower Building, Baltimore, Md., has been organized under state laws to operate sand and gravel properties. The company is headed by William E. Eckhardt, F. Edward Rasmers and Marcel A. Palle.

Mr. Edward M. Barr, Chicago manager for the Chisholm-Moore Mfg. Co. of Cleveland, died March 15th. He had been with the company for eleven years.

Mr. Edw. E. Gillen, a member of the executive board of the Wisconsin Mineral Aggregate Association, and a director of the Waukesha Lime & Stone Co., of Waukesha, Wis., has just returned from a two months visit in Europe.

The Hiddenite Quarry Co., Hiddenite, N. C., has been organized with a capital of $100,000.



TO THE LIME PLANT OPERATOR

HOW would you like to draw all your kilns with two men? We can show you how.

WOULDN'T it help your operation a lot to have a lime storage bin between the kilns and cars? We build them.

IT sounds interesting to hear that you can pick all your core with one man, with the lime passing slowly by for inspection on a simple conveyor. Doesn't it?

THE fines can be taken out of your lump lime automatically and with no hand labor. We build a screen that does it.

DO you know that an overhead gravity chute will enable you to fill barrels with lime five to ten times as fast as your present hand shoveling method? It will.

IF you have to sort your lime into two or more kinds before shipping, seat a couple of men beside a sorting conveyor and let them replace the ten or fifteen you normally need (and pay) to do this special kind of work. IT can be done.

WHY not load your bulk lime into box cars with a loader? One man can set the loader in position, fill one end of the car, reverse the loader, fill the other end, in less than one hour. This is not the same kind of work as the wheel-barrow-plank-back-breaking way.

ISN'T it logical to make a factory out of a lime plant? There are more wheel-barrows and muscles used in handling lime than any other large industry you can think of. We can eliminate a lot of it and save you the cost of investment in less than two normal years. Send for our Book No. 416.

LINK-BELT COMPANY

PHILADELPHIA
Hunting Park Ave. and P. & R. R. Rwy.

CHICAGO
300 W. Pershing Rd.

LINK-BELT

Engineer With Hadfield-Penfield

Arthur Whitcraft, M. E., well and favorably known in the steel field, has assumed charge of the manganese steel sales department of The Hadfield-Hatfield Steel Company with headquarters at Bucyrus, Ohio. Mr. Whitcraft was for a number of years successively with the Marion Steam Shovel Company, American Locomotive Company, and New York Central Railroad. He was in charge of erection, operation and supervision of heavy excavation machinery.

He was for 12 years with the American Manganese Steel Company as a Sales Engineer engaged in the design, application and sale of manganese steel castings. His experience covers every phase of the work from the moulding floor through the machine shop to the service of the castings sold.

He has had much to do with the development of new applications of manganese steel and in widening the field of its commercial use and devoted several months time to the shop during the development of the first electric manganese steel.

New Quigley Pulverized Fuel Bulletin

A new bulletin on the Quigley fuel systems, comprising methods of preparing, transporting, and burning of pulverized fuels has just been published by the Hardinge Company, 120 Broadway, New York.

This bulletin is known as No. 12 and treats the subject of pulverized fuels in a manner never before attempted. One of its distinguishing features is the fact that emphasis is laid upon the methods employed to properly prepare and burn the powdered coal, rather than occupying most of the space discussing the pulverizer.

This bulletin comes at a very opportune moment, for the burning of pulverized fuel has reached the stage in its development where its success is assured. It is now being specified by the largest power and heat engineers in the country as a solution to many problems involving the generation of heat.

Aside from complete plant layouts, what they term as a "Unit Milling Plant" is described. This layout is radically different from anything ever before developed. The system comprises a method of pulverizing and transporting the coal to one or more furnaces in the same locality, at the same time securing positive regulation and continuous operation over extended periods. The cost of this unit is but a fraction of that of the larger systems where the coal must be transported several hundred feet to a number of furnaces.

This catalog will undoubtedly be very useful to the engineer designing power plants or furnaces requiring considerable quantities of heat, as facts and figures are given which will aid him in his work. At the same time, it is written in a way that will interest the non-technical person who is seeking a general knowledge of this most interesting and talked-of subject.

New Fireless Steam Locomotive Catalog

The H. K. Porter Company, locomotive builders of Pittsburgh, Pa., have just issued a new thirty-two page booklet on the Porter fireless steam locomotive. This piece of literature is profusely illustrated with views of various Porter fireless steam locomotives in many different lines of work. Together with the illustrations and text there is included considerable engineering data on the various types. An amount of space is also given to detailing the advantages of these pieces of equipment, which operate on charges of steam secured at the stationary power plant. The H. K. Porter Company desires to analyze carefully the conditions and services of every installation and to avoid recommending the Porter fireless steam locomotive unless, in their opinion, it is the best selection. To this end there is included with each catalog a memorandum on which one who is interested in the subject may set forth the conditions and requirements applying to his particular operations. On the strength of this memorandum the company would advise the correspondent of the adaptability of some particular type of fireless locomotive or the non-adaptability of any of them. Copies of the catalog on the Porter fireless steam locomotive with engineering data may be secured from the H. K. Porter Company, Union National Bank Bldg., Pittsburgh.